

**ECE 3363**  
**Microcontrollers with C**  
**Fall 2024**  
**Syllabus**

Instructor: Dr. Seyed Mahdi Ghamkhari

Email: [segghamkh@ttu.edu](mailto:segghamkh@ttu.edu)

Class Location: Holden Hall Room 130

Class Time: Tuesdays and Thursdays from 2:00 p.m. to 3:20 p.m.

Prerequisites: EE majors only; 2.5 TTU GPA; C or better in ECE 1305 or ECE 2305 or CS 1412 and ECE 2372 (may be taken concurrently)

Office Hours: Tuesdays 11:00 a.m. to 12:00 p.m. on Zoom platform at the following link:

<https://zoom.us/j/9750385366?pwd=fJxDebeqEWZ14RVs1Yn60aXbsbdyW4.1>

**Course Description**

Advanced digital systems design. C language programming, interfacing, and applications of microcontrollers.

**Textbooks**

Cem Ünsalan and H. Deniz Gürhan, "Programmable Microcontrollers with Applications: MSP430 LaunchPad with CCS and Grace", 1<sup>st</sup> edition, McGraw-Hill Education, 2014

ISBN: 9780071830034

Website: <https://www.accessengineeringlibrary.com/content/book/9780071830034>

Click [here](#) for the Link.

John H. Davies, "MSP430 Microcontroller Basics", 1<sup>st</sup> Edition, Newnes, 2008

ISBN: 9780750682763

Website: <https://learning.oreilly.com/library/view/msp430-microcontroller-basics/9780750682763/>

Click [here](#) for the link

**Course Components**

Assignments (Homework/Quizzes/Projects): 40%

Midterm Exam: 30%

Final Exam: 30%

**Conversion of the numerical grade to letter grade**

A: 90 – 100%

B: 80 – 90%

C: 70 – 80%

D: 60 – 70%

F: 0 – 60%

## **Dates**

Classes Begin: 08/22

Holidays: 09/02, 11/27 to 11/29

WCOE Job Fair Day: 09/17 and 09/18

Last day for student-initiated drop without academic penalty: 09/09

Last day for student-initiated drop with academic penalty: 11/18

Last Day of classes: 12/03

## **Guideline**

- Students who enroll in this course must have the required prerequisites.
- The course materials, quizzes, projects and assignments are uploaded on Blackboard platform. Students' responses to the assignments should be uploaded on the same platform.
- Requests for re-grading of an assignment must be received within one week from the time the assignment is graded.
- Students should check Blackboard for the announcements regarding the course. It is recommended that you set up your Blackboard account to receive notification Emails immediately when a new announcement is made or a new assignment is uploaded.
- A response to quizzes, projects, assignments and exams that is submitted after the deadlines is not accepted and receives a grade of zero.
- Students should take notes from the materials presented in the class.
- Students should use their university email address when communicating with the instructor.
- Students should be present in the exam sessions. Makeup exams are not provided to the students who miss the exams.

## **Texas Tech University Student Code of Conduct**

<https://www.depts.ttu.edu/dos/docs/1819PARTI.pdf>

## **Attendance**

Attendance in class is required.

## **Texas Tech University Policy**

- **Students with Disabilities**

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in Weeks Hall or call 806-742-2405.

- **Academic Integrity**

Academic integrity is taking responsibility for one's own class and/or course work, being individually accountable, and demonstrating intellectual honesty and ethical behavior. Academic integrity is a personal choice to abide by the standards of intellectual honesty and responsibility. Because education is a shared effort to achieve learning through the exchange of ideas, students, faculty, and staff have the collective responsibility to build mutual trust and respect. Ethical behavior and independent thought are essential for the highest level of academic achievement, which then must be measured. Academic achievement includes scholarship, teaching, and learning, all of which are shared endeavors. Grades are a device used to quantify the successful accumulation of knowledge through learning. Adhering to the standards of academic integrity ensures grades are earned honestly. Academic integrity is the foundation upon which students, faculty, and staff build their educational and professional careers. [Texas Tech University ("University") Quality Enhancement Plan, Academic Integrity Task Force, 2010].

- **Religious Holiday**

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused under section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

- **Accommodation for Pregnant Students**

To support the academic success of pregnant and parenting students and students with pregnancy related conditions, the University offers reasonable modifications based on the student's particular needs. Any student who is pregnant or parenting a child up to age 18 or has conditions related to pregnancy may contact Alex Faris, the Texas Tech University designated Pregnancy and Parenting Liaison, to discuss support available through the University. The Liaison can be reached by emailing [alfaris@ttu.edu](mailto:alfaris@ttu.edu). Should a student communicate with the instructor that they are pregnant or have a pregnancy related condition or may need additional resources related to pregnancy or parenting, the instructor will communicate that student's information to the Title IX Coordinator, who will work with the student and others, as needed, to ensure equal access to the University's education program or activity.

For more information regarding supportive measures, please contact pregnancy & parenting liaison Alex Faris ([alfaris@ttu.edu](mailto:alfaris@ttu.edu) | 806.834.3420) or visit <https://www.depts.ttu.edu/titleix/PregnancyandParenting/index.php>. You can also visit <https://www.depts.ttu.edu/titleix/PregnancyandParenting/index.php> to submit a request to Alex Faris for assistance.

**Topics:**

1. Review of Data Types
2. MPS430 Architecture
3. Code Composer Studio
4. MPS430 Programming with C
5. MPS430 Instruction Set
6. Digital Input and Output
7. Interrupts
8. Conciliators, Clocks, Timers
9. Mixed Signal Systems
10. Digital Communication
11. Flash Memory
12. Applications

**Outline**

Week 1: Review of Data Types  
Week 2: MPS430 Architecture  
Week 3: Code Composer Studio  
Week 4: MPS430 Programming with C  
Week 5: MPS430 Instruction Set  
Week 6: Digital Input and Output  
Week 7: Interrupts  
Week 8: Review for Midterm Exam  
Week 9-10: Conciliators, Clocks, Timers  
Week 11: Mixed Signal Systems  
Week 12-13: Digital Communication  
Week 14: Flash Memory  
Week 15: Applications  
Week 16: Review for Final Exam

**Disclaimer:** The subject matter and dates for the course may evolve slightly and should be considered tentative. Updates will be announced.

**Version**

08/21/2024