CSCI241-001-45637
Computer Architecture and Assembly Language
Spring 2022 Syllabus

Class times: MTWRF 10:00 am – 10:50 am (CH 276)
Instructor: Mr. Wayne Wall

Phone: (518) 461-8465 (Cell phone, Voice & Text) [Leave your name, course number and short explanation. Be considerate and don't call between 10:00 pm and 7:00 am.] Don't call my campus office number as I rarely check it for messages.

Email: wwall@coloradomesa.edu This is the best way to reach me, as I get instant notification on my smart phone. You can also attach files.

Office hours: Physically in my CH 338 office Monday - Friday (11:00 am – 1:00 pm). Other times by appointment. This could be in-person on campus, by phone or virtual video conference (Zoom).

Textbook: There's no specific textbook for this course. Content will be presented via lecture, selected online video and website material.

COVID-19 Mask Guideline Update:

Here's a link to the CMU Mask Guidelines web page: https://www.coloradomesa.edu/covid-19/masking.html. For the first two weeks of the Spring 2022 semester (Jan 24 – Feb 4), wearing masks while attending class is mandatory. After that, the administration will revise the guidelines, so you should check the website periodically. You're expected to provide you own masks, but I will have a limited supply available for a limited time.

Course Description:

A brief introduction to electronics as it pertains to digital logic systems. Fundamentals of computer architecture starting at the logic gate level and progressing through registers, buses, arithmetic units and storage. 8-bit architectures will be used as a springboard to 32 and 64-bit machines. Machine and assembly language will be introduced along the way with specific attention to processor register transfers and sequence control, realization of fetch, address, branch and execute cycles, start, stop and reset the computer, interrupt and memory mapped input-output, peripherals and interfacing.

Lectures will be centered around hardware and software demonstrations of these principles. Homework and lab assignments will be "hands on", using individual Arduino-based electronics kits made available to each student to keep, even after the course is over.

Course Delivery

Lectures will be very demonstration oriented, presented in a classroom where each student is at an individual workstation. Some lectures will require students to bring their kits to class and "follow along". Even though daily class attendance is required (at least for the first half of the semester), each lecture will be recorded and the Zoom recordings made available for students to review later. Sometimes, technical and/or human glitches occur and the Zoom recording for a particular day may not successfully complete, so students should not depend on lecture recordings always being available.

During "mentored lab" days (which are not necessarily on fixed days each week), students will typically bring their kits to class and work on specific lab and/or homework assignments while the instructor (and possibly an upper division student assistant) circulates providing mentoring and assistance.

Since most assignments will require additional computer time outside class, I recommend students have their own computers so they can work on assignments at times convenient to them. How to install the necessary software on your own computer will be covered in class.

D2L will be used for announcements and course schedule information, links to additional content and a repository for submitting certain assignments. Campus email will be used for more immediate student-instructor communication. Students should check D2L and their campus email at least several times per day.

Student Learning Objectives:

In this class the student will develop:

- General knowledge of digital electronics principles and components.
- Knowledge concerning how these components can be combined to form computer systems.
- How assembly language relates to the computer's architecture.
- Knowledge and skill at programming these systems at the assembly language level.
- An understanding of the relationship between hardware and software through breadboard circuits.
- How to design and test a hardware/software implementation to solve specific problems.

Prerequisites:

CSCI 112 – Data Structures, CSCI 111 – Foundations of Computer Science

Grading:

Homework/Lab:	60%
In-class Exams:	20%
Final Exam:	20%

Final Grade Scale: A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, F = Below 60%.

Disruptive behavior can lead to point deduction and, in some cases, to removal from the course.

Each Sunday, detailed information concerning topics, homework, and any scheduled in-class exams for the upcoming week will be posted on D2L.

Homework assignments will take the form of "mini-projects" of specific duration each. Instructions will be posted on D2L.

Several in-class exams will be given during the semester and will consist of a combination of questions concerning lecture and homework content. In-class exams can be taken only once and will usually be announced **at least** one week in advance via D2L.

The Final Exam may be a combination of a project (to be completed outside of class) and/or an in-class test.

You have one week after a graded homework assignment or exam is returned to challenge any scoring decisions I've made. After then, scoring decisions can't be revisited. You have until the final grade submission deadline to challenge any scoring decisions on the Final Exam.

Designated in-class "mentored lab" sessions will usually (but not always) be worth 10 homework points each and cannot be "made up" later. Various homework assignments will be worth different point values (usually 25 to 100 points each) as indicated when the assignment is made. A homework assignment can only be submitted once and to receive points must be submitted before the designated due date/time. An unexcused homework submission NOT turned in before the due date/time will receive a score of zero. Since anyone can "have a bad week", I give everyone some "empathy points" to help compensate. I take the total possible homework points divided by the number of "assignments" (which include mentored labs) and add that value to the number of homework points you actually earned and use that as your homework point total in your overall course grade computation. **This usually results in a final course average point boost of 3 to 4 percentage points.**

[**Example:** Let's say there are 6 homework assignments and 10 mentored labs worth a variety of points each and the total combined possible points is 640 points. The average is 640 / 16 = 40 points. This means I add 40 points to each student's earned point total BEFORE their homework percentage is computed (based on 640 points). This "gift" boosts everyone's homework contribution. Since homework is 60% of the overall course grade, these gift points raise everyone's final course average by (40 / 640) * 0.6 = 4%. Students who lost homework points due to some poor submissions will be helped. Students who haven't lost many homework points get "bonus" homework points which might compensate indirectly for an abnormally low exam score.]

In-class exams cannot be taken outside the assigned class time without prior instructor approval. An unexcused absence from an in-class exam will result in a score of zero on the exam. **The lowest in-class exam score will be replaced with the final exam score if the final exam score is higher.**

The final weighted grade percentage will be rounded to the next greater integer if the fractional portion is 0.5 or greater and will be rounded down to the next lesser integer if the fractional portion is less than 0.5. This integer percentage will then be used to determine the final course letter grade. (**Examples:** A final weighted grade of 89.5% will round up to 90%, resulting in a letter grade of "A". A final weighted grade of 89.4% will round down to 89%, resulting in a letter grade of "B".) It won't be possible to do additional "extra credit" work to raise your final weighted grade percentage.

Attendance:

Colorado Mesa University's policies regarding attendance apply to this class. Some highlights include:

- Students are expected to attend all sessions of each course in which they are enrolled. Failure to do so may result in a lowered grade or exclusion from class at the discretion of the instructor.
- At any time during the semester, a student who fails to attend regularly may be dropped from class rolls.
- An instructor may initiate a drop or withdrawal for a student who fails to attend classes regularly.

- Students must let the instructor know ***in advance*** if they will be missing class and/or a test. Athletes, not your coach, are the ones responsible for informing me.

In addition, students are expected to be in class on time and prepared to work. Attendance will be taken daily for the first half of the semester, as CMU administration requires the instructor to report attendance bi-weekly.

Excused Absences

- Absences due to university sanctioned activities (field trips, intercollegiate sports, conference trips, etc.) will be excused provided ***advance*** notice is given and documentation supplied (if requested by the instructor).
- Absences due to serious illness or unavoidable circumstances may be excused if documentation is provided. In the case of an emergency, students may contact the Office of the Dean of Students, and that office will contact the student's instructors to inform them of the emergency.
- Being excused for an absence in no way relieves a student of the responsibility of completing all work associated with the course to the satisfaction of the instructor.
- If a student is absent for any reason, it's his/her responsibility to get the notes and/or assignments from a classmate and show up to the next class prepared.

Tardiness

Students are expected to be in class on time and prepared to work. Being late to class or leaving class early is disruptive and is not acceptable except in extreme circumstances or with prior approval of the instructor.

Academic Dishonesty:

You're required to read and understand the chapter on academic integrity in the Colorado Mesa University Student Handbook.

Expectations on in-class exams: For no reason may you use a cell phone, calculator, laptop or other personal electronic device during an in-class exam. Make sure electronic devices are placed under your workstation table and not easily accessible. When the test involves direct work on a computer the in-class lab computers will be used. The only reference materials allowed are those expressly specified by the instructor. Under no circumstances may you interact with and/or receive assistance from anyone other than the instructor.

Homework:

We'll cover the procedure to submit homework in class. You're expected to submit your work by the due date/time and late submissions will incur penalties as stated above. There is no "extra credit" available in this course.

Miscellaneous:

- Be aware I only accept email from your official Colorado Mesa University email address. This is the only way for me to verify you are the sender of the email.
- Please email me with any concerns or questions. I'll attempt to respond promptly. If you don't get a response within 24 hours, please phone or text me and leave a message with enough information so I can get back to you.

- To withdraw from this course, you must do so with a change of schedule form. It's not enough to just stop coming to class.
- Text messaging is NOT allowed in class. Notification sounds must be disabled during all sessions. Please be respectful of others. If you MUST deal with an emergency call and/or text, then leave the room and deal with it outside.

Credit Hours Policy

An undergraduate student should expect to spend a minimum of two hours outside of the classroom for every hour in class. More details are available from the instructor, the department office and in CMU's *Curriculum Policies and Procedures Manual*.

Research Assistance @ Tomlinson Library

CMU's professional reference librarians support students with their research (finding print and electronic resources, evaluating sources, and citing them) – so don't be shy!

24/7 chat support from librarians is available via the library homepage and/or you can email your questions to libref@coloradomesa.edu.

Tutorial Learning Center – TLC in HH 113

The TLC is a FREE academic service for all CMU students. Tutors are available on a walk-in basis for many courses. Do you have a quick question? Do you need homework clarification or feedback on a paper? Are you reviewing for a test? Help is available at the TLC! Check out the website for schedules at www.coloradomesa.edu/tutoring or call 248-1392 with any questions.

EAS:

In coordination with Educational Access Services, reasonable accommodations will be provided for qualified students with disabilities. Students must register with the EAS office to receive assistance. Please meet with the instructor the first week of class for information and/or contact the Coordinator of Education Access Services, directly by phone at 248-1826, or in person at Houston Hall, Suite 108.

How to Be Successful in this Course

- *Attend class regularly*. Missing class should be a rare occurrence. Each week contains new material which usually builds upon previous material.
- *Be prepared for class*. Check D2L at least once per day to find out what materials you need to bring to each class.
- *Read the auxiliary material*. The additional videos and web content are provided to support, augment and expand upon the lecture material. They are a very important part of the course and should be viewed in a timely manner in concert with a given week's topic.
- *Take notes*. Notes are a vital reference when it comes to completing homework and studying for tests!
- *Rework lecture examples outside of class*. Repetition is an important step towards proficiency!
- *Ask questions*. Don't hesitate to ask questions during the lectures or on lab/work days!
- *Participate*. Active participation (asking & answering questions during lectures, working along with example problems, etc.) is vital to understanding the concepts presented in this course.

- **Complete homework in a timely fashion**. Allow an appropriate amount of time to complete an assignment so that you are not scrambling to get it done at the last minute.
- **Study smarter, not harder, for tests**. Use posted homework solutions to your advantage, read directions, manage your time wisely, show the appropriate amount of work, etc.
- **Dedicate the appropriate amount of time to this course outside of class**. Students should plan on spending a minimum of one to two hours every day outside of class reviewing lecture notes, doing homework projects and viewing auxiliary material.
- **Utilize your resources**. Resources can include the TLC, study groups, previous homework & test solutions, etc. Keep in mind that it might wind up being a combination of these resources that make the concepts presented in this course click.
- **Use technology appropriately**. Don't become dependent on copy and paste or the internet to get through the course. Students are expected to be able to complete the vast majority of course work without these shortcuts.
- **Be prepared to work for the grade you want**. Just showing up to class and/or casually completing homework & studying for tests does not necessarily guarantee a passing grade. Additional effort may be required in certain areas of the course to ultimately obtain the grade you're after.
- **Remember that engineering is not a spectator sport**. This is a fast-paced course and many concepts will quickly build upon each other. If you start to fall behind in class or on the concepts covered in the homework it will more than likely become increasingly difficult for you to catch up. If you are having difficulties with the material, I encourage you to talk with me outside of class to get the extra help you may need.

CMU Student Success Tips

CMU student success tips can be found at
http://www.coloradomesa.edu/academics/documents/StudentSuccessatCMU_WCCC.pdf.