

CMSC 313 Syllabus - Section 5 - Spring 2024

Dates and Times

Lecture times: Monday 2:30pm - 3:45pm, Wednesday 2:30pm - 3:45pm

Lecture location: ITE 231

Instructional Team

The Faculty Instructor for the course is Raphael Elspas. For questions with homework or project help please first contact the TAs. For administrative related questions, DEI exemptions, absences or regrades, contact Raphael Elspas at relspas@umbc.edu.

Raphael Elspas' office hours: Monday 4pm - 5pm, Wednesday 4pm - 5pm

Raphael Elspas' office location: ITE 349.

The TAs for the class is Srinivas Badiga.

The TAs office hours are Thursday 2:30pm - 4:30pm.

The TAs office location is ITE 334.

Prerequisites

Students must have completed CMSC 202 and CMSC 203 with a grade of 'C' or better.

Description

This course introduces the student to the low-level abstraction of a computer system from a programmer's point of view, with an emphasis on low-level programming. Topics include data representation, assembly language programming, the process of compiling and linking, low-level memory management, digital logic, and basic processor architecture.

Schedule

| Week | Day | Content (from slides) | Work Assigned | Work Due |
|------|--------|------------------------|---------------|-------------------------------|
| 1 | 1/29 M | Bases, 2s complement | | |
| | 1/31 W | | | |
| 2 | 2/5 M | Boolean Algebra, Gates | HW 1 | |
| | 2/7 W | | | |
| 3 | 2/12 M | Gates, K-Map | HW 2 | HW 1 (11:59pm) |
| | 2/14 W | | | Quiz 1 (in class, covers HW1) |

| Week | Day | Content (from slides) | Work Assigned | Work Due |
|------|--------|---|---------------|--|
| 4 | 2/19 M | Adders & Decoders | HW 3 | HW 2 (11:59pm) |
| | 2/21 W | | | |
| 5 | 2/26 M | State Tables & Diagrams | HW 4 | HW 3 (11:59pm) |
| | 2/28 W | | | Quiz 2 (in class, covers HW2, HW3) |
| 6 | 3/4 M | Sequential circuits | HW 5 | HW 4 (11:59pm) |
| | 3/6 W | | | |
| 7 | 3/11 M | Architecture | HW 6 | HW 5 (11:59pm) |
| | 3/13 W | | | Quiz 3 (in class, covers HW4, HW5) |
| 8 | 3/18 M | [Spring Break] | | |
| | 3/20 W | [Spring Break] | | |
| 9 | 3/25 M | x86 Architecture | Project 1 | |
| | 3/27 W | | | HW 6 (11:59pm) (updated) |
| 10 | 4/1 M | Assembly I | | |
| | 4/3 W | | | Quiz 4 (in class) |
| 11 | 4/8 M | [No Class - Solar Eclipse] | Project 2 | Project 1 (11:59pm) |
| | 4/10 W | Assembly II, GDB | | |
| 12 | 4/15 M | Branches & Subroutines | | |
| | 4/17 W | Recursion & C functions | | Quiz 5 (in class) |
| 13 | 4/22 M | [No Class - Teacher out] | Project 3 | Project 2 (11:59pm) |
| | 4/24 W | [No Class - Teacher out] | | |
| 14 | 4/29 M | [No Class - Teacher out] | | |
| | 5/1 W | | | |
| 15 | 5/6 M | Memory translation | Extra Credit | |
| | 5/8 W | | | Quiz 6 (in class), Project 3 (11:59pm) |
| 16 | 5/13 M | [Quiz Makeup] | | Extra Credit (11:59pm) |
| | 5/17 F | Final Exam - Friday, May 17, 1pm - 3pm | | |

Course Materials

The optional course textbook will be Logic and Computer Design Fundamentals, 3rd Ed. by *M. Morris Mano and Charles R. Kime*. The slides used for this course cover content in the textbook will be posted to Blackboard as they become available. Nonetheless, the slides will be the de facto source for content in this class.

Topics

- Number Systems
 - Binary and Integer Representations
 - Signed and Unsigned Numbers
 - IEEE Floating Point
- Digital Logic Design
 - Combinational Logic
 - Sequential Logic
 - Boolean Algebra
 - Size Optimizations
- Computer Organization
 - Arithmetic Logic Units
 - Arithmetic Circuits
 - Register Files
 - Instruction and Data memory
- Assembly Language Programming
 - Programming Environment
 - Registers and memory
 - Conditions and loops
 - Functions and the stack discipline
 - Arrays
 - Interfacing C and Assembly Language
 - Linking
- Programming in C
 - Dynamic Memory
 - Pointers

Grading

Assignments in the class take the form of homework every week for the first half of the semester, 3 projects for the second half of the semester, quizzes every two/three weeks, and one extra credit assignment. The extra credit assignment is designed to provide an extra measure to bump up your grade.

Grading Weights

| Type | Weight |
|---------------|--------|
| HW (x6) | 30% |
| Projects (x3) | 30% |
| Quizzes (x6) | 20% |

| Type | Weight |
|--------------|--------|
| Final Exam | 20% |
| Extra Credit | 5% |
| Total | 105% |

Your lowest quiz grade will be dropped. Anyone can retake up to 2 quizzes on the last day of class. For example, if you retake quiz 1 a second time, the larger grade of the first and second times you took the quiz will be used for your grade. This can only help you.

Late Work

All homework assignments are to be submitted by 11:59pm on the day they are due. In most cases, they are due Monday night. Presuming Monday as the due date:

| Day assignment submitted | Penalty |
|------------------------------------|-----------|
| Monday 11:59pm | on time |
| Tuesday 11:59pm (one day late) | -10% |
| Wednesday 11:59pm (two days late) | -25% |
| Thursday 11:59pm (three days late) | -50% |
| Four or more days late | no credit |

If you request in advance, an excused late pass can be granted. This will only be granted for 3 days for no deduction of penalty, after which the 1-2-3 day penalty above applies. Unexcused tardy assignments incur the penalty described above.

Regrades

You have the opportunity to ask for regrades on Homeworks and Projects. A rubric will be used to grade each assignment. All points added or taken away will reference the rubric. Note that a regrade could make your grade for an assignment go down. A regrade must be accompanied by an explanation for why you think the grading was done incorrectly. Saying "I think I deserve more points for this" is not a good explanation and will likely incur just having your assignment returned without a regrade. Saying, however, "I think you misgraded a carry bit on the addition in question 3. A value should be carried in the 10's place, but you graded it that there shouldn't be one there."

Academic Honesty

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community, in which everyone's academic work and behavior are held to

the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory. [Statement adopted by UMBC's Undergraduate Council and Provost's Office.]

Cheating in any form will not be tolerated. In particular, the submission of any elements of published work, another student's work, or your own previously published or submitted work without proper attribution will not be tolerated. If you have any questions about what is acceptable, please bring them to me before submitting your work. The minimum penalty for a violation of the academic honesty policy is a zero on the assignment. Other penalties may include a letter grade reduction, failing the class, or, in extreme or repeated cases, dismissal from the program.

Homework Collaboration Policy

While representing others' work as your own will not be tolerated, working together is encouraged. You should acknowledge such collaborators in your assignment, and your work should still be written independently. That is, you can arrive at an understanding of how to approach problems by talking with other students, but should generate your own answers after having any such discussions with your peers. Copying other students' work (or copying from any other source) will result in a zero for everyone involved (I have no way of knowing which student was the source) and all cheating will be reported to central university authorities.

Artificial Intelligence Policy

For this class, if you use ChatGPT (or similar chatbots or AI-based generation tools), you must describe exactly how you used it, including providing the prompt, original generation, and your edits. This applies to prose, code, or any form of content creation. Not disclosing is an academic integrity violation. If you do disclose, your answer may receive anywhere from 0 to full credit, depending on the extent of substantive edits, achievement of learning outcomes, and overall circumvention of those outcomes.

Use of AI/automatic tools for grammatical assistance (such as spell-checkers or Grammarly) or small-scale predictive text (e.g., next word prediction, tab completion) is okay. Provided the use of these tools does not change the substance of your work, use of these tools may be, but is not required to be, disclosed.

Information From the Office of Equity and Inclusion

Accessibility and Disability Accommodations, Guidance and Resources

Accommodations for students with disabilities are provided for all students with a qualified disability under the Americans with Disabilities Act (ADA & ADAAA) and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that creates equal access for students when barriers to participation exist in University courses, programs, or activities.

If you have a documented disability and need to request academic accommodations in your courses, please refer to the SDS website at sds.umbc.edu for registration information and office procedures.

SDS email: disAbility@umbc.edu

SDS phone: 410-455-2459

If you will be using SDS approved accommodations in this class, please contact the instructor to discuss implementation of the accommodations. During remote instruction requirements due to COVID, communication and flexibility will be essential for success. Please do this [within the first week of school](#) so that your accommodations can be provided by the time of the first quiz (second week).

Sexual Assault, Sexual Harassment, and Gender Based Violence and Discrimination

[UMBC Policy](#) in addition to federal and state law (to include Title IX) prohibits discrimination and harassment on the basis of sex, sexual orientation, and gender identity in University programs and activities. Any student who is impacted by sexual harassment, sexual assault, domestic violence, dating violence, stalking, sexual exploitation, gender discrimination, pregnancy discrimination, gender-based harassment, or related retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources. The Title IX Coordinator can be reached at titleixcoordinator@umbc.edu or 410-455-1717.

You can access support and resources even if you do not want to take any further action. You will not be forced to file a formal complaint or police report. Please be aware that the University may take action on its own if essential to protect the safety of the community.

If you are interested in making a report, please use the [Online Reporting/Referral Form](#). Please note that, if you report anonymously, the University's ability to respond will be limited.

Notice that Faculty and Teaching Assistants are Responsible Employees with Mandatory Reporting Obligations

All faculty members and teaching assistants are considered Responsible Employees, per UMBC's [Policy on Sexual Misconduct, Sexual Harassment, and Gender Discrimination](#). Faculty and teaching assistants therefore required to report all known information regarding alleged conduct that may be a violation of the Policy to the Title IX Coordinator, even if a student discloses an experience that occurred before attending UMBC and/or an incident that only involves people not affiliated with UMBC. Reports are required regardless of the amount of detail provided and even in instances where support has already been offered or received.

While faculty members want to encourage you to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report past and present sexual harassment, sexual assault, domestic and dating violence, stalking, and gender discrimination that is shared with them to the Title IX Coordinator so that the University can inform students of their [rights, resources, and support](#). While you are encouraged to do so, you are not obligated to respond to outreach conducted as a result of a report to the Title IX Coordinator.

If you need to speak with someone in confidence, who does not have an obligation to report to the Title IX Coordinator, UMBC has a number of [Confidential Resources](#) available to support you:

[Retriever Integrated Health](#) (Main Campus): 410-455-2472; Monday – Friday 8:30 a.m. – 5 p.m.; For After-Hours Support, Call 988.

[Center for Counseling and Well-Being](#) (Shady Grove Campus): 301-738-6273; Monday-Thursday 10:00a.m. – 7:00 p.m. and Friday 10:00 a.m. – 2:00 p.m. (virtual) [Online Appointment Request Form](#)

Pastoral Counseling via [The Gathering Space for Spiritual Well-Being](#): 410-455-6795; i3b@umbc.edu; Monday – Friday 8:00 a.m. – 10:00 p.m.

Other Resources

[Women's Center](#) (open to students of all genders): 410-455-2714; womenscenter@umbc.edu; Monday – Thursday 9:30 a.m. – 5:00 p.m. and Friday 10:00 a.m. – 4 p.m.

[Shady Grove Student Resources](#), [Maryland Resources](#), [National Resources](#).

[Child Abuse and Neglect](#)

Please note that Maryland law and [UMBC policy](#) require that faculty report all disclosures or suspicions of child abuse or neglect to the Department of Social Services and/or the police even if the person who experienced the abuse or neglect is now over 18.

[Pregnant and Parenting Students](#)

UMBC's [Policy on Sexual Misconduct, Sexual Harassment and Gender Discrimination](#) expressly prohibits all forms of discrimination and harassment on the basis of sex, including pregnancy.

Resources for pregnant, parenting and breastfeeding students are available through the University's [Office of Equity and Civil Rights](#). Pregnant and parenting students are encouraged to contact the Title IX Coordinator to discuss plans and ensure ongoing access to their academic program with respect to a leave of absence – returning following leave, or any other accommodation that may be needed related to pregnancy, childbirth, adoption, breastfeeding, and/or the early months of parenting.

In addition, students who are pregnant and have an impairment related to their pregnancy that qualifies as disability under the ADA may be entitled to accommodations through the [Office of Student Disability Services](#).

Religious Observances & Accommodations

UMBC [Policy](#) provides that students should not be penalized because of observances of their religious beliefs, and that students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences or requested modifications for religious observances in advance, and as early as possible. For questions or guidance regarding religious observances and accommodations, please contact the Office of Equity and Civil Rights at ecr@umbc.edu.

Hate, Bias, Discrimination and Harassment

UMBC values safety, cultural and ethnic diversity, social responsibility, lifelong learning, equity, and civic engagement.

Consistent with these principles, [UMBC Policy](#) prohibits discrimination and harassment in its educational programs and activities or with respect to employment terms and conditions based on race, creed, color, religion, sex, gender, pregnancy, ancestry, age, gender identity or expression, national origin, veterans status, marital status, sexual orientation, physical or mental disability, or genetic information.

Students (and faculty and staff) who experience discrimination, harassment, hate, or bias based upon a protected status or who have such matters reported to them should use the [online reporting/referral form](#) to report discrimination, hate, or bias incidents. You may report incidents that happen to you anonymously. Please note that, if you report anonymously, the University's ability to respond may be limited.

Acknowledgements

Thank you to Don Engel for providing resources from which I prepared this course.