Syllabus for Math 248, Computers and Numerical Algorithms

Instructor: Dr. Zev Woodstock — woodstzc@jmu.edu ✉
Office: Roop 310 — zevwoodstock.github.io 🌐
Office hours: Tu 14:05–15:05, F 12:30–13:30 and by appointment — Canvas link ↗

Prerequisites: Math 236

Class Details: Math 248, Computers and Numerical Algorithms, Spring 2025
Section 0001: M/F: 10:20 – 11:10 and Tu/Th: 9:35 – 10:50 in Burruss 030
Section 0002: M/F: 1:50 – 14:40 and Tu/Th: 12:45 – 14:00 in Burruss 030.

Book and Documentation: The following free electronic online textbook (Both Parts 1 and 2) is available on Canvas:
Computers and Numerical Algorithms by C. D. Pruett and A. Tongen

The documentation for the four languages accepted in this class are below. Part 1 of the class text focuses on MATLAB, so if you are using another programming language, you are encouraged to supplement the assigned reading (see the class schedule) with the relevant documentation below.

Python 3 documentation: https://www.python.org/doc/ ↗

Julia documentation: https://docs.julialang.org/en/v1/ ↗ PDF version is here. ↗

Octave documentation: https://docs.octave.org/latest/ ↗

Matlab documentation: https://www.mathworks.com/help/matlab/index.html ↗

Calculators: Unless explicitly allowed within an assignment, the only machines allowed for assistance on assessments (including exams and quizzes) have **only** the ability to compute $+$, $-$, $\times$, $\div$, exponentiation, logarithms, trigonometric functions, and roots (e.g., square root). Machines with any other capabilities, (e.g., phones) are not allowed. For *homework and programming assignments*, graphing calculators such as Desmos ↗ and a programming languages for scientific computing (e.g., Python, Octave, Julia, or Matlab) are allowed. Unless specifically stated as a requirement in an assignment, the use of LLMs (e.g., ChatGPT, LLAMA3, Copilot) or algorithmic solvers (e.g., Wolfram Alpha, Maple, and Gurobi) are prohibited.

Grading: Programming assignments, homework, quizzes, and classwork comprise 55% of the final grade. There will be one midterm exam (20% of the final grade) and a final exam (25% of the final grade). Grades will be assigned according to the following scheme, with $+/-$ assigned if within 2

points of the closest grade.

A: Over 90%,   B: $89.\overline{9}\%$ – 80%,   C: $79.\overline{9}\%$ – 70%,   D: $69.\overline{9}\%$ – 60%,   F: under 60%.

UNIVERSITY POLICIES: For JMU policies for attendance, inclement weather, disability accommodations and religious accommodations, please see: `http://www.jmu.edu/syllabus/` ☑

HONOR CODE All students must abide by the JMU honor code at all times. Cheating comes with serious repercussions: `http://www.jmu.edu/honorcode/` ☑.

ATTENDANCE: Attendance of all students is expected. Students are responsible for all of the information covered in-class, and the students will gain experience working on problems that prepare them for quizzes, exams, and programming assignments. Absences may be excused with appropriate evidence according to University Policy (see above) in combination with appropriate notice to the instructor. *Excused absences include, e.g.,:* weddings, funerals, family/home emergencies, religious holidays, mental health reasons, physical health reasons, doctor appointments, hospitalizations, jury service and subpoenas, NCAA athletics involvement, and anything else the Provost's office deems worthy (in writing) of an excused absence.

If an excusable absence is *known in advance* (e.g., court appearance, medical appointment, etc.), notice must be provided via email to the instructor as early as possible prior to the absence (minimum 24 hours). If the student misses class for an *excusable and unexpected* reason (e.g., due to unexpected hospitalization), they must provide notice within 1 week of their return to university activities. The instructor may require evidence of an absence excuse, but per University Policy, students are never obliged to divulge specific medical information.

PROGRAMMING ASSIGNMENTS/CLASSWORK/HOMEWORK/QUIZZES: In-class group and individual assignments may be given with little or no notice; if these assignments are missed for an unexcused reason, 0 credit will be given. If a student misses a quiz or classwork with an excused absence (with proper notice in accordance with the Attendance policy above), then their classwork/homework/quiz average will not include the missed assignment. If a student has an excusable reason for absence during a period when an out-of-class individual assignment is due, they are eligible for a deadline extension; students must request this extension within one week of their return to university activities. If all assignments in a particular category (classwork, quizzes, programming assignments, or homework) are missed, 0 credit will be received in that category.

For this class, *programming assignments* may be graded based on any (or all) of the following criterion: (1) submission of working code, (2) a technical write-up with documentation explaining how to use a program and how it works, (3) a "stand-up" style short presentation explaining how a program works with a live demonstration, and/or (4) an interview asking students to explain specific lines of their submitted code. If I attempt to run your code and it does not compile/run on my machine, then the maximum possible score for the coding part of your assignment is 50% (even if everything is correct until your final line of code).

PROGRAMMING LANGUAGE If you are required to submit code for an assignment, it can be submitted in Python 3 ☑, Julia ☑, Octave ☑, or MATLAB (although the entire assignment must be in one language). Python, Julia, and Octave are free. MATLAB usually requires payment, although JMU students can install MATLAB for free ☑. You are not required to install all four languages; please

select a language (or languages) that will best prepare you to meet your career goals. If you have not programmed before, you are advised to only select one language. There are *many, many* free online resources for installing these programming languages, and you can get started by following the instructions in the following links Python 3 ☑, Julia ☑, Octave ☑, or MATLAB ☑ .

EXAMS: Exams missed for an *unexcused* reason receive 0 credit, with no opportunity for a makeup exam. For *excused* absences, the student must contact the instructor prior to the exam via email to arrange a make-up exam. If a make-up exam is not taken within 1 week of the original exam date, 0 credit will be received. For circumstances that are serious, unplanned, unavoidable, and beyond the student's control (e.g., a student is hospitalized and unable to organize a make-up exam in time), contact the instructor and the situation will be handled on an individual basis.

EMAILS: All email correspondence must be formatted in a professional manner: this includes a greeting, closing, proper grammar/formatting, and all relevant information (e.g., class, section number, and/or absence dates). Emails that do not abide by this policy will not receive a response. I will not help diagnose malfunctioning code by e-mail: if you are having an issue with your code not working, search the documentation and the internet for a diagnosis / solution.

GRADE APPEALS: Specific grading disputes (points totaled incorrectly, partial credit appeals, missing assignments on Canvas, etc.) should be brought to the instructor's attention within 1 week of return of the assignment or its posting date on Canvas. This does not guarantee a grade change. Appeals outside of this timeframe will not be considered. Appeals must be received before final grades are submitted to the registrar.

ADDITIONAL HELP: Please make use of the following free resources available to JMU students.

→ This class relies heavily on programming. To get extra practice, check out Project Euler ☑ .

→ My office hours are **Tuesdays 14:05–15:05**, **Fridays 12:30–13:30**, **and by appointment**. If my office hours do not meet your schedule, write me an email and we will find a meeting time.

→ If class is missed for any reason, refer to the schedule in this syllabus which **section** of the text to read; also, check the class website for additional notes and resources. While the class book focuses on MATLAB, many of the logical structures (if/else conditions, for/while loops, etc.) are the same in other languages – they just use different syntax. Refer to the documentation for specific syntax in other languages.

→ JMU offers accessibility accommodations ☑ , including extra exam time, note takers, and recorded lectures.

→ The JMU Counseling Center ☑ has many resources and programs that are **free** to students.

→ Madison Cares ☑ is a service for referring students of concern who may need help.

Week 1: 1/20 – 1/23: Part I: §1, 2
Week 2: 1/26 – 1/30: Part I: §2, 3, 4
Week 3: 2/2 – 2/6: Part I: §3, 4
Week 4: 2/9 – 2/13: Part I: §5, 6; Part 2: §1 **2/10:** Withdrawal deadline
Week 5: 2/16 – 2/20: Part 2: §2, 3
Week 6: 2/23 – 2/27: Part 2: §3, 4 §
Week 7: 3/2 – 3/6: Part 2: §4
Week 8: 3/9 – 3/13: Part 2: §5
      Spring Break: 3/16 – 3/20: no class
Week 9: 3/23 – 3/27: Part 2: §5, 7
Week 10: 3/30– 4/3: Part 2: §7
Week 11: 4/6 – 4/10: Part 2: §7, 8
Week 12: 4/13 – 4/17: Part 2: §8, 9
Week 13: 4/20 – 4/24: Part 2: §9, 6
Week 14: 4/27– 5/1: Part 2: §6
Week 15: 5/4 – 5/6 Projects
Final exam:[1]
      Section 0001: Thursday, 5/07, 10:30 AM - 12:30 PM in Burruss 030
      Section 0002: Monday, 5/11, 1:00 PM - 3:00 PM in Burruss 030

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[1]https://www.jmu.edu/registrar/wm_library/spring_exam_schedule.pdf ↗