

# MATH 3430: Computational Techniques for Science and Mathematics

## Section 001/501, MWF 12:00–12:50, and MW 1:00–1:50

### Course Information:

Instructor: Chris Monico  
 Email: [c.monico@ttu.edu](mailto:c.monico@ttu.edu)  
 Office: MA-252  
 Office Hours: T/Th 12:10–2:00, F: 2:00–3:00, or by appointment.  
 Required Text: None. Notes will be provided.

### Course outline/Important Dates:

Prerequisite: MATH 2450 and 2360 or consent of department. Emphasis on scientific computing and problem solving techniques using state-of-the-art mathematics software packages. Restricted to mathematics majors or students enrolled in a secondary mathematics teacher program.

The focus of this course is on C programming for the mathematician. The following is my best approximation of the topics to be covered and the length of time we'll spend on each. Note that various mathematical subjects will be covered throughout, mostly in the form of programming exercises.

compiled languages & intro to C	week 1
arithmetic, keywords, stdio	week 2
recursion	week 3
data types, pointers, arrays	week 4
structures & pointers	week 5
casting, dynamic memory allocation, debugging	weeks 6-7
Mandelbrot set, Newton fractals, Conway's Game of Life	weeks 8-9
abstract data types, searching and sorting	weeks 10-11

Exam 1	Friday 9/27.
Exam 2	Friday 10/25
Last day to drop a course	Monday 10/28.
Last day of classes	Wednesday 12/4.
Final Exam	<b>Saturday 12/7, 10:30–1:00.</b>

**Attendance:** Class attendance is *mandatory*. It is assumed that you will attend, so I will not waste your time by taking attendance. However, keep in mind that it will be decidedly difficult for you to pass this course if you do not attend. If you arrive late to class, enter quietly. If you miss a class, it is your responsibility to find out what you missed (assignments, notes,...); either ask a fellow student or come by my office to find out. If you are absent for an exam, you will be permitted to make it up *if and only if* you are absent for one of the following reasons:

- You are out of town performing duties on behalf of the university (i.e., athletics). Advance notification is required.
- Religious holiday (see below).
- **Severe** illness, documented by a physician.

- Death in the family.
- Other extenuating circumstances, at the instructor’s discretion (I am *not* very generous with this).

**Expected Learning Outcomes** Students reinforce their knowledge of concepts from arithmetic, algebra, number theory, calculus, and linear algebra by learning how to write code in a high-level computer language to study and demonstrate these concepts. Students will become familiar with the general capabilities of a programming language, standard algorithms and data types, and obtain experience employing these capabilities to solve problems.

**Assessment of learning outcomes** The expected learning outcomes for the course will be assessed through scheduled exams and homework assignments. Your final grade in this course will be determined by the weighted components and grading scale below.

Grade components		Grade Scale	
Homework:	40%	90–100%	A
Exam 1:	20%	80–89%	B
Exam 2:	20%	65–79%	C
Final Exam:	20%	55–64%	D
		0–54%	F

**ADA Accommodation:** Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as possible to make necessary arrangements. Students must present appropriate verification from Student Disability Services during the instructor’s office hours. Please note that instructors are not allowed to provide classroom accommodation to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services office in 335 West Hall or call 806-742-2405.

**Religious Holy Day Observance (OP 34.19)**

1. “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.
2. 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.
3. 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.