

**COURSE SYLLABUS**  
**Mathematical Computing**  
**MATH 4330-001 (CRN 27531)**

## Instructor Information

Giorgio Borna, Associate Professor  
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Office hours: W 01:00-03:50pm, or by appointment.  
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## Weekly Meetings

TR 12:30 pm - 1:50 pm, room Math 113

## General Description

This course is intended to introduce mathematics majors to special topics in mathematics and programming. While the students may be assumed to be advanced mathematics students, they are assumed to be beginning programming students. The course is designed with a hands-on approach: lectures are held in a computer laboratory where each student will have one computer available.

Prerequisite: consent of department.

## Outline

1. Introduction to Linux-based Operating Systems
2. The Bash Shell Language
3. The C Language
4. The C++ Language
5. Implementation in C and/or C++ of Algorithms for the Numerical Solution of Mathematical Problems

## Expected Student Learning Outcomes

Students are expected to master how computers can be used to perform advanced automatic tasks and to implement mathematical algorithms effectively and efficiently. In particular, students are expected to learn to:

- use shell languages to interact with operating systems and perform automatic tasks;
- write source code in imperative programming paradigm and generate executables;
- identify causes of incorrect program behavior through debugging techniques;
- translate mathematical algorithms into computer programs using the appropriate syntax.

## Assessment of Learning Outcomes

### Examinations

- Exam #1: **Thursday, February 20**, worth 25% of the final grade
- Exam #2: **Tuesday, April 7**, worth 25% of the final grade
- Final Exam: **Tuesday, May 12, 1:30 p.m. to 4:00 p.m., room Math 113**, worth 25% of the final grade

The instructor will specify what topics must be studied for each exam.

### Homework

Homework assignments will be given throughout the semester. Students will be informed by the instructor and via email (on the @ttu.edu address) about the homework, which must be completed before the given deadline.

Homework is worth 25% of the final grade.

### Attendance

Attendance is mandatory. Students with up to 4 missed classes for the entire semester will receive an additional bonus of 3% on the final grade.

## Grading Policy

Let  $g$  be the grade in percent:  $g < 55$  F,  $55 \leq g < 66$  D,  $66 \leq g < 77$  C,  $77 \leq g < 88$  B,  $88 \leq g < 98$  A,  $g \geq 98$  A+

The grading policy may be subject to slight adjustments depending on the achievements of the students.

## Make-ups

There are usually no make-ups for the examinations, except for reasons of illness, stated in writing by a medical doctor, or observance of a religious holiday, or other very reasonable motivations.

## Reference Books for Consultation

- *Bash Cookbook*, by C. Albing, J.P. Vossen, and C. Newham - O'Reilly
- *The C Programming Language*, by B. Kernighan, D. Ritchie - Prentice Hall
- *The C++ Programming Language*, by B. Stroustrup - Addison-Wesley
- *Numerical Mathematics*, by A. Quarteroni, R. Sacco and F. Saleri - Springer

## Class Policies

If students miss a class, it is their responsibility to find out what they missed (announcements, assignments, notes ...). Also, it is their responsibility to frequently check their e-mail for announcements made by the instructor. Students are strongly encouraged to read each section of the textbook in advance of the lecture.

Classes start and end always on time. Students are not allowed to leave the class before the end of the hour without authorization. During class time it is not allowed to text, chat and sleep. All electronic devices must be put in silent mode.

## TTU Operating Policies

### Americans with Disabilities Act (TTU OP 34.22)

Any student who, because of a disability, may require some special arrangements in order to meet 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 student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

### Absence for observance of a religious holy day (TTU 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 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.

### Academic Honesty (TTU OP 34.12)

It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension. "Scholastic dishonesty" includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

### The grade of "I" (TTU OP 34.12)

The grade of "I" is given only when a student's work is satisfactory but, due to reasons beyond his or her control, cannot be completed. It is not given in lieu of an "F" or "W". The instructor assigning the grade will stipulate in writing at the time the grade is given the conditions under which the "I" may be removed. The assigned work and a change of grade must be recorded within one calendar year from the date of the "I". Failure to do so results in an "F" for that course.