

# Math 4370: Special Topics: Mathematical Programming

## Fall 2015 Syllabus

### 1 Course Information

- Location and Time: MW 4:30pm–5:50pm, 407 Lee Drain Building
- Professor: Dr. Martin Malandro
- Department: Mathematics and Statistics
- Office: 409 Lee Drain Building
- E-mail (preferred method of contact): malandro@shsu.edu
- Phone number: (936) 294-1580
- Office Hours: Thursday 11:30am–2:30pm, and by appointment.

**Course Description:** In this class you will learn Sage, a powerful and free open-source mathematical programming language. Sage is based on the popular programming language Python, so by taking this class you will learn Python as well. This class will be taught in a computer lab and will be, for the most part, a “hands on” experience. You will develop algorithms for solving challenging mathematical problems and will explore issues of computational complexity. Prerequisite: Math 1430 (Calculus II) and COSC 1436 (Programming Fundamentals I). Credit 3.

**Course Objectives/Learning Outcomes:** A successful student will:

- gain an understanding of the differences between Sage and Python,
- be able to use both Sage and Python for a variety of computational tasks,
- gain a better understanding of issues of computational complexity (both in theory and in practice), and
- gain experience presenting mathematical insights in written and oral formats.

### 2 Grading Policy

Your grade in the course will be calculated using the following weights:

Project	50%
Participation and Presentations	20%
Exam 1	15%
Exam 2	15%

Grading Scale:

A	90% or better final average
B	80–89% final average
C	70–79% final average
D	60–69% final average
F	59% or lower final average

**Course Project:** You are required to complete a programming project in Sage with significant mathematical content. You have two weeks at the beginning of the semester to come up with a project. If you cannot come up with a project on your own, one will be assigned to you. You will also be required to turn in regular project updates, which will include (at a minimum) your current code and a written description of what state your project is in and what you intend to do next. Specific instructions for each required update will be given.

Here is the timeline and breakdown for how your project will be graded.

Oral project approval	Sept. 9	5%
Written project description	Sept. 11, 5pm	5%
Project update 1	Sept. 23	10%
Project update 2	Oct. 7	10%
Project update 3	Oct. 21	10%
Project update 4	Nov. 11	10%
Project update 5	Dec. 2	5%
Final project due	Dec. 7	45%

**Exams:** In-class exams will consist of basic programming exercises in Sage. They will test your familiarity with Sage structures and your ability to research new Sage syntax as necessary. If you are keeping up with your project you should have little difficulty. Exams are intended to mimic a typical real-world development environment, so they will be **open book** and, for the most part, **open internet**. However they **will not be open-classmate**. As such, cell phones and any parts of the internet you could use to communicate with your classmates (such as email) are disallowed during exams.

**Exam make-up policy:** If you miss an exam, you will be expected to show appropriate cause in writing. If you must miss an exam, I expect you to contact me beforehand. If that is impossible, then you must contact me no later than 24 hours after the exam. If you miss an exam and have not contacted me by this time, you forfeit your right to a make-up.

**Academic Honesty Policy:** Except for exams, you may work together on any part of the course and may consult any source you wish. If you got an **idea** from someone else (including an internet source), you must acknowledge it with a comment in your code.

However, **do not copy anyone else's code**. All code you turn in must be your own and must reflect your own understanding. It is usually very easy to spot copied code, even if you rearrange it or change variable names. Do not copy anyone else's code (including code you find on the internet) and do not allow your code to be copied. Both myself and a TA will be looking at code to spot dishonesty. I may ask you to explain any portion of your code at any time.

Violations of this Honesty Policy will result in a grade of F in the course. You may also be referred to the dean on academic dishonesty charges.

**Extra Credit Policy:** No extra credit is available.

**Late Work Policy:** Late work will not be accepted. Everything you turn in will be turned in via email or Blackboard, so there is no excuse for late work.

**Grade Dispute Policy:** All grade issues need to be brought to my attention within one week of having your grade returned/posted.

**Participation and Presentations:** We will use the first ~ 20 minutes of class each day for student presentations of mathematical insights gleaned while working on their projects. You will earn points for giving presentations and for participation (meaning being on time and attentive during these presentations, and on task during the rest of classroom time). Points for asking good questions, giving good answers, and assisting classmates in class are also available. Presentation topics must be approved in advance.

### 3 Classroom Policies

**Attendance Policy:** I expect you to be on time and attend every class.

**Classroom Rules of Conduct:** Students must refrain from behavior in class that disrupts the learning process. Students are prohibited from using tobacco or smoking products in class, making offensive remarks, reading newspapers, sleeping, talking at inappropriate times or about inappropriate things, wearing inappropriate clothing, using cellphones, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

Math-related questions and math-related discussion in the classroom are encouraged. However, chatter is disruptive to the learning process and will not be tolerated. Furthermore, any variation of the question “do we need to know this for the test?” is banned.

**Use of Telephones and Text Messengers in Class:** Generally speaking, you may not use cell phones, computers, or other devices capable of communication in class. The one exception is that during lecture periods, you may keep your cell phone on vibrate so that you can receive text messages in case of an emergency. You may not, however, be distracted or distracting to others in checking your text messages in class, and you may not send text messages in class. All messengers must be put away for exams. SHSU Academic Policy Statement 100728 states that *even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty.* I have no choice in this matter, so if your phone goes off during a test, please don't answer it or even pull it out to look at it.

### 4 Schedule

Here are all the important dates for the semester.

Oral project approval due	Sept. 9
Written project description due	Sept. 11, 5pm
Project update 1 due	Sept. 23
Exam 1	Sept. 30
Project update 2 due	Oct. 7
Project update 3 due	Oct. 21
Exam 2	Nov. 4
Project update 4 due	Nov. 11
Project update 5 due	Dec. 2
Final project due	Dec. 7

### 5 Additional Information

All information on this syllabus is subject to change. All changes will be announced in class. Further university policies regarding academic dishonesty, student absences on religious holy days, disabilities, and visitors in the classroom which apply to this course may be found at <http://www.shsu.edu/syllabus/>. If there is a conflict between information on this syllabus and official university policy, university policy takes precedence.