



Biomedical Engineering
Kate Gleason College of Engineering
BIME 191, Spring 2023

Course Syllabus

Intro to Programming for Biomedical Engineering

Instructor	Dr. Cory Stiehl Office: Institute Hall, Room 3108 Phone: (585) 475-2723 Email: cksbme@rit.edu Office Hours: Mon 2:00 – 3:00, Tues 3:00 – 4:00, Wed 2:00 – 3:00, Thurs 3:00 – 4:00
Teaching Assistants	Section 02 – Chrisia Daniels, Section 03 – Rafi Karim
Learning Assistant	Alyssa Saynganthone
Lecture	Section 02 – Tuesday & Thursday, 11:00 AM – 12:50 PM, INS-1160 Section 03 – Tuesday & Thursday, 1:00 PM – 2:50 PM, INS-1160
Prerequisites	BIME-181 or EGEN-100 or an equivalent course
Required Text	None

Course Description

Builds on the overview of the field of biomedical engineering presented in the BIME-181 course with the following additional components: 1) Introduction to programming as an organized, problem solving method (VBA and Matlab), 2) Application of programming for the purpose of performing engineering calculations, 3) Introduction to common engineering tools (Excel and Matlab) used to analyze engineering data.

Course Objectives

- Students will be able to demonstrate a thorough knowledge of a sequential computer programming language, including input/output methods, variables, repetition structures, decision structures, arrays, and subprograms.
- Students will be able to develop algorithms to perform complex engineering calculations.
- Students will be able to write VBA macros to solve a variety of engineering problems.
- Students will be able to write Matlab m-files to solve a variety of engineering problems.
- Students will be able to use Excel spreadsheets to analyze engineering data.
- Students will be able to use Matlab to analyze engineering data.
- Students will demonstrate professional work ethics, including precision, neatness, and ability to follow instructions and meet deadlines.

Technology Requirements

- Laptop for use during each class
- Access to Microsoft Word and Microsoft Excel software, installed and ready to use at the first class
- Access to Matlab software (free student license), beginning after Spring Break
- Access to MyCourses
- Ability to scan handwritten work and upload it to MyCourses as a pdf document
- Please contact the instructor if you don't have access to any of the required technology



Grading

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|------------------------|-----|
| • In-Class Assignments | 15% |
| • Homework / Quizzes | 45% |
| • Exams | 40% |

Based on the 100% total listed above, letter grades will be assigned as follows:

- | | |
|----------------|----|
| • 93.0 – 100% | A |
| • 90.0 – 92.9% | A- |
| • 87.0 – 89.9% | B+ |
| • 83.0 – 86.9% | B |
| • 80.0 – 82.9% | B- |
| • 77.0 – 79.9% | C+ |
| • 73.0 – 76.9% | C |
| • 70.0 – 72.9% | C- |
| • 67.0 – 69.9% | D+ |
| • 60.0 – 66.9% | D |
| • 0 – 59.9% | F |

General Expectations

- Allot an average of 6-8 hours per week to preparing for class and completing homework assignments.
- Attend class. Attendance is not taken formally. However, missing class means missing the in-class assignment for that day.
- If you cannot attend class, please contact the instructor as soon as possible to find out what you have missed; we will work with you to ensure that you understand the material.
- Be on time for class, and stay on task.
- Check MyCourses daily for any new announcements or updates in content.

Lecture Policies

You will need to bring a laptop to each class in order to complete the graded in-class assignments. The course schedule provides an outline of the topics that will be covered in each class. Often there will be a short slideshow and quiz that must be completed in MyCourses before class. Class time will be dedicated to reviewing concepts, working through example problems, and applying the concepts learned by working on in-class practice problems. Active class participation will improve your understanding of the material and enhance your communication skills. You are expected to actively participate in class by asking questions, sharing ideas, and completing the problem solving assignments. Finished example problems and solutions to the in-class practice problems will be posted in MyCourses.

In-Class Assignments

After the lecture portion of each class, students will be given an in-class assignment to complete. These will be turned in at the end of the class period via the MyCourses Assignments tool, and will be scored based on whether or not the solution is complete, correct, and presented in a professional manner. No make-ups are allowed, however, the lowest two scores will be dropped. If there are extenuating circumstances that may warrant an exception, please discuss these with Dr. Stiehl. Students will be able to get help with the problems during class from the instructor, TA, and other students. Solutions will be posted in MyCourses after students have all turned in the assignment.



Homework

A tentative schedule of homework assignments is provided on the course schedule. Homework assignments will be posted in the Announcements area of MyCourses, along with submission instructions and due dates for each assignment. Assignments will be turned in and graded using the Assignments tool in MyCourses. Note that some assignments will require hand-written work, which will need to be scanned and uploaded to MyCourses, and some assignments will require the use of Word, Excel or Matlab. Completed assignments should be turned in by 11:59 PM on the designated due date. Late homework will incur a late penalty of 2% per hour. Exceptions will be handled on a case by case basis; requests must be made within one week of the assignment due date. Please remember to present your final solutions with a professional appearance.

Exams

The exams will be closed book, closed notes; however, you are allowed to use one 8.5" by 11" page of notes for each exam. Two exams will be given during the semester. The dates for these exams are provided on the course schedule. Missed exams will be handled on a case by case basis.

Academic Integrity

As an institution of higher learning, RIT expects students to behave honestly and ethically at all times, especially when submitting work for evaluation in conjunction with any course or degree requirement. The Department of Biomedical Engineering encourages all students to become familiar with RIT's [Academic Integrity Policy](#), [Honor Code](#), and [Student Conduct Policy](#).

Note that academic misconduct includes, but is not limited to: copying or sharing answers on tests or assignments, plagiarism, and having someone else do your academic work. Depending on the act, a student could receive an F grade on a test/assignment, receive an F grade for the course, or be suspended or expelled from the Institute.

To be specific in regards to homework problems for this class, you may not:

- Consult a solution manual or student solutions from a previous semester
- Copy all or part of another person's problem (including a computer program)
- Use another person's results (either graphs or numerical results)
- Use any part of another report or document which is not your own

This does not mean that you cannot discuss problems and get help. However, such help must be directed toward understanding general concepts, techniques, programming language rules, and helping to find and explain programming errors (without correcting the errors). It simply means that when you turn in problems, including computer programs, that you **MUST** do the work entirely on your own. If you are ever in doubt if the help you are giving or receiving is permissible, just ask!

Academic Adjustments

RIT is committed to providing academic adjustments to students with disabilities. If you would like to request academic adjustments such as testing modifications due to a disability, please contact the Disability Services Office. Contact information for the DSO and information about how to request adjustments can be found at <http://www.rit.edu/dso>. After you receive academic adjustment approval, it is imperative that you contact me as early as possible so that we can work out whatever arrangement is necessary.

Title IX

Title IX violations are taken very seriously at RIT. RIT is committed to investigate complaints of sexual discrimination, sexual harassment, sexual assault and other sexual misconduct, and to ensure that appropriate action is taken to stop the behavior, prevent its recurrence and remedy its effects. Please view the [Title IX Rights & Resources at RIT](#)



COURSE SCHEDULE

WEEK	DATE	TOPICS	DUE
1	Jan 17	Intro to Excel: formulas, data analysis	
	Jan 19	Intro to Excel: graphing, curve fitting, data analysis	
2	Jan 24	Intro to Programming: Algorithms, flowcharts and trace tables	
	Jan 26	Intro to Programming: Algorithms, flowcharts and trace tables	HW 1
3	Jan 31	Programming Basics: VBA variables, dialog boxes	
	Feb 02	Programming Basics: VBA interactions with the spreadsheet	HW 2
4	Feb 07	Branching: VBA one-line if statement, block if structure	
	Feb 09	Looping: VBA do/loop structure and for/next structure	HW 3
5	Feb 14	Array Variables: VBA one-dimensional arrays	
	Feb 16	Array Variables: VBA two-dimensional arrays	HW4
6	Feb 21	Subprograms: VBA Functions	
	Feb 23	Subprograms: VBA Subroutines	HW 5
7	Feb 28	Reading & Writing to Text Files: VBA open, close, input and print	
	Mar 02	VBA Project	
8	Mar 07	VBA Project	HW 6
	Mar 09	Exam 1	
9	Mar 14	No Class – Spring Break	
	Mar 16		
10	Mar 21	Matrix math review	
	Mar 23	Intro to Matlab: command line basics, matrix math	
11	Mar 28	Intro to Matlab: graphing, curve fitting, and statistics	
	Mar 30	Programming Basics: Matlab m-files, variables, I/O (command line, text files)	HW 7
12	Apr 04	Programming Basics: Matlab cell arrays, I/O (dialog boxes)	
	Apr 06	Branching: Matlab block if structure and switch case structure	HW 8
13	Apr 11	Looping: Matlab while structure and for structure	
	Apr 13	Array Variables: Matlab arrays and matrices	HW 9
14	Apr 18	Subprograms: Matlab user-defined functions & anonymous functions	
	Apr 20	Matlab project	HW 10
15	Apr 25	Matlab project	
	Apr 27	Exam 2	HW 11
16	May 02	Reading Day – No Class	
	TBD	Final Exam	