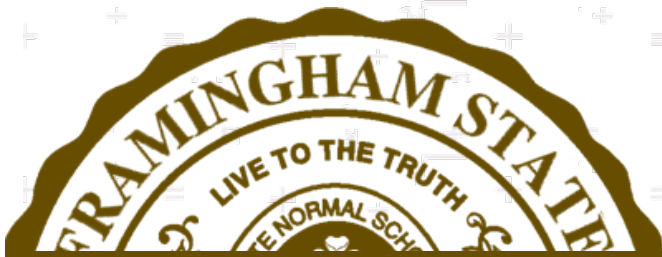


# MATH 123R Introduction to Functions

**Sections 1A1 and 1B1:** Monday, 8:30 AM – 10:20 AM, Hemenway Hall 405  
Wednesday, 8:30 AM – 10:20 AM, Hemenway Hall 405  
(1A1 | CRN 20427) Friday, 8:30 AM – 9:20 AM, Hemenway Hall 201  
(1B1 | CRN 20449) Friday, 9:30 AM – 10:20 AM, Hemenway Hall 201



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**Office:** Hemenway Hall 402B

**Student Hours:** Monday, 10:30 AM – 11:30 AM  
Wednesday, 10:30 AM – 11:30 AM  
Thursday, 10:30 AM – 12:30 PM  
Friday, 10:30 AM – 11:30 AM

Most people view mathematics as involving variables, equations, graphs, and theorems. Well, the diverse areas of mathematics all involve at least one of these, and knowledge of these and other concepts and methods of mathematics enable us to represent, explore, and analyze relationships among quantities in managerial, life, social, and physical sciences. Are you interested in the study of our galaxy, space exploration, and the age and size of the universe? Without variables, we could not represent Hubble's Law<sup>i</sup> which states that the observed radial velocity of a galaxy moving away from us is directly proportional to the earth's distance from that galaxy. Listening to news reports on television or radio and reading newspapers, we encounter a lot of information about the spread of, for example, Ebola<sup>ii</sup>, Influenza<sup>iii</sup>, and Measles<sup>iv</sup>. A great deal of data is collected, yet, models, useful in studying the spread of disease, cannot be created, analyzed or used to make predictions about the spread of disease without, among other things, variables, understanding of relationships among quantities, functions, and equations. Even when exploring maps of regions where diseases occur, we must understand how to perform conversions so that a map scale<sup>v</sup> of 1:100000, for example, is meaningful and useful. The study of change in, distribution of, and rate of change of populations of various species (humans included, of course) are of interest to biologist<sup>vi</sup>, environmentalist<sup>vii</sup>, economists<sup>viii</sup>, and geographers<sup>ix</sup>, among others. Although related, change in population, distribution of population, rate of change of population and, even, density of population are different types of quantities, and each provides important information about how a species may or may not be thriving within its environment. All sectors of the workforce from Business<sup>x</sup> to the Federal Government<sup>xi</sup> use graphs to represent and analyze data. Yet, we cannot make diagrams and graphs unless we understand how values are associated and reveal any underlying dependence. That said, why should we study functions? Knowledge of functions empowers us with problem solving and modeling skills necessary to perform real-world analysis, enabling us to explore our realm using multiple approaches – numerical, graphical, and symbolic – as we seek solutions to problems which affect our lives such as the existence of global warming<sup>xii</sup>, finding alternative energy sources<sup>xiii</sup>, developing new antibiotics<sup>xiv</sup>, stemming the spread of COVID-19<sup>xv</sup>, or curing cancer.

## Course Description and Learning Objectives

An exploration of numerical, graphical, and symbolic approaches to algebraic concepts with emphasis on real-world applications, modeling, and problem-solving skills. Topics include polynomials, rational expressions, equations and inequalities, systems of linear equations, matrices, and the connection between functions and their graphs. This course includes an additional a one-hour per week lecture recitation. Topics may vary by section at the discretion of the instructor with the goal of supporting students' readiness for, and success, in the lecture course.

### General Education Domain II-A

**Analysis, Modeling, and Problem Solving:** The study of analytical, quantitative, and/or formal reasoning methods involving the manipulation of numbers or other symbols to solve problems.

### Learning Objectives:

- 3 – Solve Problems Using Quantitative Thinking
- 8 – Solve Problems Using Creative Thinking

Overall, you should develop the skills needed to analyze and model information, use functions and equations in a variety of situations, and investigate real-world problems as well as the capacity to discuss, both verbally and in writing, your analysis with others.

## What is in this syllabus?

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## Attendance

**Attendance** during each course meeting is *expected* and will be *noted*. Lateness of more than ten (10) minutes counts toward an absence as does leaving early, *without an appropriate reason* discussed with the instructor *in advance*.

- If you miss a course meeting, it is *your* responsibility **(i)** to access the *class notes* and *summary* posted on the *Notes* page on *Canvas* and **(ii)** to obtain related course-meeting information *from* your email, the course website, *Canvas*, and other course members. Absence does *not* entitle you to an extension for submitting assignments, taking quizzes, or taking examinations. *It is your responsibility to read and work through any course work that you miss due to your absence as well as complete course-related work on time.*
- You may miss **no more than five (5) course hours** during the semester *without penalty* to the participation component of your course grade; Monday and Wednesday course meetings *each* count for two (2) course hours, and Friday course meetings count for one (1) course hour. If you are absent for more than five (5) course hours during the semester, your participation for each missed course meeting beyond the allowed five (5) course-hour absences will be recorded as a zero (0). Since it is your choice how you use these five (5) allowed course-hour absences, *no excuses or doctor's notes will be accepted.*

**CAUTION:** Not being present during course meetings jeopardizes your grade as you miss course material and topic discussions, group problem solving and analysis of examples, and information about assignments, quizzes, and examinations.

## Mask Policy

As recommended by the Department of Public Health on Mass.gov, you should "stay home when you have symptoms of any respiratory illness, like flu, [COVID-19](#), and RSV" as "[staying home when sick](#) helps prevent the spread of germs". In addition, "[wearing a mask](#) provides protection against COVID and other viruses, especially when indoors or in crowded spaces" ... "if you have a weakened immune system, ... are at increased risk for severe disease ... , or ... someone in your household ... is at increased risk for severe disease". Although the use of masks is voluntary in all settings, I request that you wear a mask during any face-to-face meetings with me. I will wear a mask during my face-to-face meetings with you.

**NOTE:** The mask policy will be updated as needed.

## Course Etiquette

You are expected to pay attention, be respectful, and participate during course meetings. Do not talk over or interrupt others: wait your turn to contribute to discussions and analysis. Use respectful language at all times: the use of profanity is unacceptable as is the use of disrespectful and threatening language. Neither disruptive behavior nor disrespectful conduct will not be tolerated.

- All electronic devices not used for course work **MUST** be turned off and put away.
- You are expected to be *present* and *actively engaged* during course meetings. This includes contributing to course discussions and problem solving and asking questions.

You cannot make meaningful contributions during course meetings when you are, for example, texting, monitoring social media, watching videos, playing games, surfing the web, or doing assignments for other courses: such activities should be done on *your time*, not during *course time*. Those performing such activities during course meetings will be considered to be absent from class and will be directed to leave the classroom.

- Do not interrupt course meetings by announcing *your late arrival* or *your early departure* – everyone can see *you*.
- Do not disrupt course meetings with noise. Eating and crinkling wrappers, taking phone calls (which is totally inappropriate and unacceptable during course meetings), tapping, singing, humming, playing music (even with headphones, which is unacceptable as well), watching videos, having conversations, and other activities should be performed on *your time*, not during course meetings. Those performing such activities during course meetings will be considered to be absent from class and will be directed to leave the classroom.

You are expected to conduct yourself in a mature, respectful, and professional manner *at all times*. As stated in the [Classroom Conduct Policy](#).

*Framingham State University supports the principles of freedom of expression for both faculty and students. In order to maintain these principles, all students and course instructors are entitled to a safe, positive, and constructive teaching and learning environment. Disruptive or dangerous behaviors in classrooms and other academic settings can disturb teaching and learning, and these behaviors will not be tolerated. Any individual who engages in disruptive or dangerous behaviors in classrooms may be subject to disciplinary action in accordance with the Classroom Conduct Policy found in the University undergraduate catalog.*

## Class Preparation and Participation

**Being prepared for class** includes, but is not limited to, doing assigned readings *before* each course meeting, working on practice exercises (in the eBook, provided on course handouts, sent via email or posted online, and available via *MyMathLab*), reviewing class notes and summaries of course meetings posted on the *Notes* page on *Canvas* prior to each class, maintaining and updating your course notebook (which should include class notes and the practice exercises on which you are working), and having appropriate materials such as your notebook and writing instruments as well as, *when directed to do so*, a calculator or computer for use during course meetings.

**Participation** can be contributions to course discussions, in-class problem solving, and analysis of real-world scenarios *as well as questions*. Questions are a very important component of the learning process: *your questions are significant contributions to each course meeting*. **There is no such thing as a stupid question.**

## Assignments and Quizzes

Via quizzes and *MyMathLab* assignments, you will apply the concepts, topics, and methods discussed and examined during course meetings. It is *your* responsibility to be present for quizzes and to complete *MyMathLab* assignments on time.

- 10-minute **Quizzes** will be administered at the end of course meetings on Fridays. Since the numbers used in quiz problems will be sufficiently rigged and since approximations are unacceptable, calculators will not be allowed.
- **MyMathLab (a.k.a., MyLab Math [MML]) assignments** are completed *entirely* online; no written work is submitted. These problems are set so that you may rework the problems as needed. That is, if you do not earn full credit on a problem, you may rework the problem (until MML runs out of new versions for the problem).

## Make-up and Late Submission Policy

**Neither make-up examinations nor make-up quizzes will be administered.** Examinations will be administered on the stated dates, quizzes will be administered on Fridays, and *MyMathLab* assignments will *not* be available *after* the due date. The grade for an examination or a quiz that is not taken or a *MyMathLab* assignment which is not submitted will be recorded as zero (0).

**NOTE:** The last day to withdraw from a course *without* a *W*-grade is Tuesday, January 28, 2025, and the last day to withdraw from a course *with* a *W*-grade is Friday, April 25, 2025. The last day to change course grade status to *Credit/No Credit* is Friday, April 25, 2025.

## Examination Dates

There will be two (2) examinations, a midterm examination and a *comprehensive/cumulative* final examination. The dates for these *mandatory* examinations are listed below.

<b>Midterm Examination</b>	. . . . .	<b>Wednesday, March 12, 2025</b>
<b>Final Exam</b>	. . . . .	<b>Wednesday, May 14, 2025, 8 AM – 11AM, in Hemenway Hall 405</b>

Although the date for the midterm examination may be changed, if needed, the date for the final examination, set by the University, **CANNOT** be changed.

## Course Grade Percentages

Your course **grade** will be determined by your participation during course meetings, scores on the quizzes and *MyMathLab* assignments, score on the midterm examination, and score on the *cumulative* final examination.

The components of your course grade will be weighted as follows:

<b>Course Participation</b>	. . . . .	<b>10 %</b>
<b>Assignments and Quizzes</b>	. . . . .	<b>55 %</b>
<b>Midterm Examination</b>	. . . . .	<b>15 %</b>
<b>Final Examination</b>	. . . . .	<b>20 %</b>

The weights for the graded components of the course may be adjusted, if necessary, to reflect any changes in the workload during the semester.

## Required Textbook, Software, and Supplies

College Algebra, 12th Edition, by Michael Sullivan with [MyMathLab](#)

We will use the [MyMathLab](#) (also known as *MyLab Math* [MML]) system throughout the course for eBook access, practice exercises, online assignments, and a variety of resources.

The software for the course is MS Office, and you need a scientific calculator which must, at least, have built-in linear, quadratic, and cubic regression functions. You must install the Zoom app on your computer in order to meet with me remotely.

## Academic Honesty

You are expected to read the sections of the Framingham State University [undergraduate catalog](#) that describe the *University Policy Regarding Academic Honesty* and the *Procedures for Handling Cases of Alleged Infractions of Academic Honesty*.

- *Examples* of infractions of the *University Policy Regarding Academic Honesty* include: giving or receiving help on assignments on which you are expected to do your own work (i.e., unauthorized collaboration); giving or receiving help during quizzes or examinations; distribution, acceptance, or use of materials during quizzes or examinations *without* the permission of the instructor; and altering work on graded materials in an attempt to obtain additional credit.
- Plagiarism, *looking at or copying from* another student's assignment, quiz, or examination, allowing another student to *look at or copy from your* assignment, quiz, or examination, doing an assignment, quiz, or examination *for someone else*, and having someone do an assignment, quiz, or examination for you are additional examples of breaches of the *University Policy Regarding Academic Honesty*.
- Not being truthful about your health, not being upright regarding the illness or death of a friend or family member, not being forthright regarding your availability to take an examination or quiz, not being honorable about the operation of your computer or your computer-access, not be forthright about the operation of your calculator or your calculator-access, not being honest regarding the submission of an assignment, and not being truthful about your ability to be present for an examination or a quiz are examples of violations of the *University Policy Regarding Academic Honesty* as well.
- Submitting work for problems on other versions of an examination, quiz, or assignment serves as *evidence* of violation of the *University Policy Regarding Academic Honesty* as does submitting work involving terminology, notation, and/or methods not used in this course or submitting work similar to that of another student.

All infractions of the *University Policy Regarding Academic Honesty* will be reported to the Dean of Students, the appropriate college dean(s), and the Office of Community Standards, and the appropriate University procedures will be followed.

## Communication

Course emails will be sent using the *student.framingham.edu* email address for each course member listed on *MyFramingham*.

- All email correspondence must be signed using your full name. The subject line for course communication is "**MATH 123R Intro to Fns:**" followed by a meaningful – *not blank* – reason for the communication; quotation marks are *not* used in subject lines for messages. You should sign your message using your *full name* – do *NOT* put your name in the subject line.
- Replies will be sent to messages sent from *student.framingham.edu* email addresses or those generated via the *Canvas* message system only.

## If you are feeling lost or overwhelmed ...

### 1. Meet with me

You are always welcome to meet with me during student hours: student hours are for you. You may speak with me after class, call me, or email me to set up an individual or group appointment. Your questions are important to me: questions are a valuable and significant component in learning new concepts and exploring new methods.

To set up an appointment during which to meet via Zoom, send a request via email using your *student.framingham.edu* email address. Once the day and time have been determined, you will receive a Zoom meeting invitation containing the URL and meeting ID.

### 2. Use the resources available on Canvas, the course website, and MyMathLab

Class notes (*created during course meetings*) are posted on *Canvas* after each course meeting, and summaries of our in-class analysis are posted with the class notes. Course handouts and resources are available on the course website. Practice exercises with the view-a-similar-problem feature, additional examples, and videos are available via *MyMathLab*.

### 3. Meet with tutors available at CASA or via ThinkingStorm

The Center for Academic Success and Achievement (CASA) provides tutors from whom you may receive additional help. *ThinkingStorm Online Tutoring* may be accessed via the menu on *Canvas*. Additional information about tutoring can be accessed on the [Extra Help](#) page of the course website.

- Replies will *not* be sent to comments added to graded quizzes or graded exams returned via *Canvas*. Graded-examination facilities and graded-quiz facilities on *Canvas* are *NOT* a means for communication. If you would like to ask a question about a graded examination or a graded quiz, you should send an email message or meet with me during student hours.
- When you communicate by **phone**, clearly identify yourself using your full name and state the course section for which you are registered *at the beginning* of the conversation or voice message. If you leave a **voice message**, speak *slowly* and *clearly* so that your name, course information, contact information, and message can be understood.  
**NOTE:** Sending an email message is a better means of communication than leaving a voice message.

## FSU Notice of Non-Discrimination and Diversity

Framingham State University is committed to a policy of [non-discrimination](#), [equal opportunity](#), [diversity](#), and affirmative action. The University is dedicated to providing educational, working, and living environments that value the diverse backgrounds of all people. Furthermore, the Massachusetts Civil Rights Act (“MCRA”, M.G.L. c. 12, §§ 11H, 11I, 11J) protects the rights of all residents of and visitors to Massachusetts to be free from bias-motivated threats, intimidation, and coercion that interfere with their civil rights. The MCRA protects the right to attend school, live peacefully, and enjoy other basic rights.

## FSU Commitment to Antiracism

At Framingham State University, faculty, staff, and students work together to sustain a learning, working, and living community free from hate, discrimination, harassment, and intolerance. We recognize the damaging effects of systemic racism – including policies, structures, and historic practices – on the experience and success of communities of color. Coming from different backgrounds and different levels of privilege, we can all affirm and engage in antiracist work.

Diversity of voices, and of minds, strengthens our ability to solve problems and to ask and answer questions about the world we share. As your instructor, I commit to upholding community values of inclusion, civility, accessibility, and mutual respect. I expect *all course members* to commit to creating a community that affirms and welcomes all persons from diverse backgrounds and experiences, and support the realization of everyone’s potential.

## Disability/Access Services

“Framingham State University offers equal opportunities to all qualified students, including those with disabilities. The University is committed to making reasonable accommodations as necessary to ensure that its programs and activities do not discriminate, or have the effect of discriminating, on the basis of disability. Disability/Access Services works with students with ADD/ADHD, Autism Spectrum Disorder, learning and psychiatric disabilities, students with mobility disabilities, students who are blind or low vision, students who are d/Deaf or hard of hearing, and students with chronic medical conditions.”\*<sup>‡</sup>

“Disability/Access Services works to provide reasonable accommodations to qualified students. The purpose of accommodations, modifications, and/or auxiliary aids is to reduce or eliminate any disadvantages that may exist because of a disability. Framingham State University is not mandated by law to waive specific courses or academic requirements considered essential to a particular program or degree. Rather, the University is mandated to modify existing requirements on a case-by-case basis in order to ensure that individuals are not discriminated against on the basis of their disability.”\*<sup>‡</sup>

- For further information, please visit the [Center for Academic Success and Achievement \(CASA\)](#) section of the Framingham State University web site or contact LaDonna Bridges, Dean of Student Success and Persistence, at 508-626-4906 or [lbridges@framingham.edu](mailto:lbridges@framingham.edu), or Tanya Milette, Associate Director of Disability/Access Services, at 508-626-4627 or [tmilette@framingham.edu](mailto:tmilette@framingham.edu).

## Final Comments

You are welcome and encouraged to meet with me if you have any concerns about the course. It may happen that our analysis and discussions of topics and methods seem clear as we work together during course meetings but *appear* foreign when you work on practice exercises *on your own*. Consider discussing and working on practice exercises with others, and *please* know that *you are always welcome to work with me*. I would be glad to work with you: I am here to help you to learn and **I want to help you**. When you learn new material, it is normal to have questions: *questions are a natural part of the learning process*. Asking questions helps you to identify concepts and methods that necessitate

\* <https://www.framingham.edu/academics/academic-success/center-academic-success-and-achievement>

further exploration and helps you to incorporate new ideas, approaches, and strategies into your knowledge base. Always remember that **there is no such thing as a stupid question.**

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- i [http://www.astro.cornell.edu/academics/courses/astro201/hubbles\\_law.htm](http://www.astro.cornell.edu/academics/courses/astro201/hubbles_law.htm)  
<http://hyperphysics.phy-astr.gsu.edu/hbase/astro/hubble.html#c1>  
[http://csep10.phys.utk.edu/astr162/lect/cosmology/hubble\\_constant.html](http://csep10.phys.utk.edu/astr162/lect/cosmology/hubble_constant.html)
  - ii <http://www.healthmap.org/ebola/#timeline>  
<http://www.foxnews.com/health/2014-ebola-outbreak-map>
  - iii <http://www.cdc.gov/flu/weekly/usmap.htm>  
<http://www.cdc.gov/flu/weekly/fluactivitysurv.htm>
  - iv <http://www.usatoday.com/story/news/2015/01/18/disney-measles-spreads/21953767/>  
<http://www.latimes.com/local/lanow/la-me-ln-disneyland-employee-measles-20150120-story.html>  
<http://www.latimes.com/local/california/la-me-places-where-measles-patients-have-been-20150117-story.html>
  - v <http://pubs.usgs.gov/unnumbered/70039582/report.pdf>  
<http://data.geocomm.com/helpdesk/scale.html>
  - vi <http://marinebio.org/oceans/marine-biology/>  
<http://web.stanford.edu/group/ecoevo/research/PopBioDem.html>
  - vii <http://www.nature.com/scitable/knowledge/population-ecology-13228167>
  - viii [http://www.oeaw.ac.at/vid/research/r\\_populationeconomics.shtml](http://www.oeaw.ac.at/vid/research/r_populationeconomics.shtml)
  - ix [http://education.nationalgeographic.com/education/encyclopedia/geography/?ar\\_a=1](http://education.nationalgeographic.com/education/encyclopedia/geography/?ar_a=1)
  - x <http://www.theatlantic.com/business/archive/2013/12/the-most-important-economic-stories-of-2013-in-44-graphs/282193/>
  - xi [http://data.bls.gov/pdq/SurveyOutputServlet?request\\_action=wh&graph\\_name=LN\\_cpsbref3](http://data.bls.gov/pdq/SurveyOutputServlet?request_action=wh&graph_name=LN_cpsbref3)  
<http://www.bls.gov/news.release/pdf/cpi.pdf>  
<http://www.bls.gov/news.release/pdf/ximpim.pdf>
  - xii [http://www.theregister.co.uk/2015/01/19/no\\_scientific\\_consensus\\_on\\_2014\\_hottest\\_year\\_on\\_record\\_claims/](http://www.theregister.co.uk/2015/01/19/no_scientific_consensus_on_2014_hottest_year_on_record_claims/)  
<http://www.scientificamerican.com/article/2014-to-be-hottest-year-ever-measured/>
  - xiii <http://www.altenergy.org/>  
<http://www.conserve-energy-future.com/AlternativeEnergySources.php>
  - xiv <http://www.northeastern.edu/news/2015/01/kim-lewis-teixobactin-nature-paper/>
  - xv <https://www.cdc.gov/socialmedia/syndication/405380/403327.html>  
<https://covid19.nih.gov/>  
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/global-research-on-novel-coronavirus-2019-ncov>  
<https://www.nhs.uk/conditions/covid-19/how-to-avoid-catching-and-spreading-covid-19/>  
<https://www.health.harvard.edu/diseases-and-conditions/coronavirus-resource-center>