

# **Basic Mathematics for the Sciences MATH 115 (Spring 2017)**

**Section 006 (Monday, Wednesday, and Friday 1:00–1:50)**

**Section 008 (Monday and Wednesday 3:00–3:50;  
Thursday 3:30–4:20)**

**Section 012 (Tuesday and Thursday 12:00–12:50;  
Thursday 1:00–1:50)**

## ***INSTRUCTOR***

Stanley Max  
Lecturer in Mathematics

## ***OFFICE***

Department of Mathematics  
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## ***E-MAIL***

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## ***TELEPHONE AND FAX NUMBERS***

(410) 704-3084

## ***OFFICE HOURS***

Mondays 2:00 to 2:50; Tuesdays 1:00 to 3:00; Wednesday: 2:00 to 2:50;  
Thursdays 2:00 to 3:00

## ***COURSE DESCRIPTION***

Intended primarily for students in biology, natural sciences, environmental studies, medical technology, and nursing. Functions and equations: linear, quadratic, exponential, trigonometric. Applications of concepts and skills to the life and physical sciences are stressed. Not open to those who successfully completed MATH 119. Prerequisites: two years of algebra or MATH 102 or MATH 109, and one year of plane geometry.

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### ***LEARNING GOALS***

This University core course is designed to meet these four learning goals:

- Construct and evaluate logical arguments
- Apply and adapt a variety of appropriate strategies to solve mathematical problems
- Recognize and apply mathematics in contexts outside of mathematics
- Organize and consolidate mathematical thinking through written and oral communication

### ***COURSE OBJECTIVES***

As a result of taking this course, students should learn about various types of mathematical functions, especially those of a linear, quadratic, exponential, logarithmic, or trigonometric nature. Students should also learn how to apply such functions to solving real-world problems in the life and physical sciences as well as in personal finance.

### ***ONLINE HOMEWORK***

Twelve online homework assignments, conducted through a program called MyMathLab, will be due. This is an important feature of the course. You can access this program in one of two ways:

- By purchasing a new book at the Towson University bookstore, where the book comes packaged with an access code. The course is taught using this textbook: Robert Blitzer, *MATH 115 Basic Mathematics for the Sciences*, Towson University edition (Upper Saddle River NJ: Prentice Hall, 2014).
- By purchasing the program online from the website [www.mymathlab.com](http://www.mymathlab.com). An electronic version of the textbook is embedded in the online purchase.

In whatever way you register for MyMathLab, you also need a class code, which I will supply to you.

The due dates for the online assignments are indicated in the schedule of topics further on in this syllabus, and they are also listed in your MyMathLab account when you log onto it. All the online homework assignments averaged together will count towards 19% of your final grade.

### ***REQUIRED CALCULATOR***

A graphing calculator is required for this course. I have posted separate instructions as to the make and model of graphing calculator that I recommend on my website.

### ***TESTS AND EXAMINATIONS***

The testing for the course consists of three online tests and one online final exam. These tests and final exam are held in the lab (that is, LI 232, as just noted).

Take note of the following examination schedule:

- Test 1 takes place during Week 4.
- Test 2 takes place during Week 8.
- Test 3 takes place during Week 12.
- The Final Exam takes place during Final Exam.

### ***ATTENDANCE***

Attendance will be taken at the beginning of every lecture and lab, and will count for 10% of the course grade. **Students remain responsible for all instructional activity conducted in each class.**

Regarding absences, the university catalog makes this statement:

“It is policy of the university to excuse the absences of students for the following reasons:

- illness or injury when the student is unable to attend class
- religious observance where the nature of the observance prevents the student from attending class
- participation in university activities at the request of university authorities (e.g., Intercollegiate Athletics, Forensics Team, Dance Company, etc.)
- compelling verifiable circumstances beyond the control of the student

Students requesting an excused absence must provide documentation to the instructor two weeks prior to the scheduled absence when known in advance or as soon as possible when not known in advance.

### ***PREPARING FOR EXAMS AND LEARNING THE MATERIAL***

To learn the material and prepare for the exams in this course, above all you should attend class regularly. Furthermore, the online homework assignments provide an excellent learning source, besides being an important component of the course grade.

### ***TUTORING***

The Academic Achievement Center (ACC) makes tutoring services for this course available on a drop-in basis and by appointment. You can receive tutoring at the Mathematics Lab at 7800 York Road, Room 105. For detailed information, look at the ACC's website, located at this URL:

<http://www.towson.edu/aac/LocationsAndSchedules.asp>

### ***ACADEMIC INTEGRITY***

This class is conducted in accordance with the Towson University Code of Conduct as described in the TU Catalog or accessed at the following website:

[https://inside.towson.edu/generalcampus/tupolicies/documents/03-01.00\\_Student\\_Academic\\_Integrity\\_Policy.pdf](https://inside.towson.edu/generalcampus/tupolicies/documents/03-01.00_Student_Academic_Integrity_Policy.pdf)

This code prohibits all forms of dishonesty including cheating and plagiarism. Plagiarism is copying the words of another or using the ideas of another without proper citation. Cheating or plagiarism in any form is unacceptable and a penalty commensurate with the offense will be applied. The range of penalties includes deduction of points or rejection of the assignment, failure of the course, or a more severe disciplinary action by university authorities.

### ***DIVERSITY***

In accordance with the Towson University Strategic Plan, the Fisher College of Science and Mathematics Diversity Action Plan, and the Department of Mathematics Diversity Action Plan, everyone participating in this course is expected to be respectful of each other without regard to race, class, linguistic background, religion, political beliefs, sex, gender identity or expression, sexual orientation, ethnicity, age, veteran status, or physical ability. If you feel these expectations have not been met, please speak with your instructor or the designated diversity liaison, who is Dr. Elizabeth Goode, [egoode@towson.edu](mailto:egoode@towson.edu), (410) 704-4981.

### ***DISABILITY SUPPORT SERVICES***

Towson University is committed to providing equal access to its programs and services for students with disabilities, in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with disabilities Act of 1990. To learn how to arrange for any appropriate accommodations, students with disabilities should visit the Disabilities Support Services (DSS) webpage at this URL:

<http://www.towson.edu/dss>

If you are a student with disabilities, then you have the responsibility to let me know that you have needs in this area. You will need a memo from DSS authorizing accommodations.

***DETERMINATION OF YOUR GRADE***

<b>GRADED COMPONENTS</b>	
Test 1	15%
Test 2	18%
Test 3	18%
Final Exam	20%
Online homework	19%
Attendance	10%

<b>FINAL GRADE CUT-OFFS (where <math>x</math> is your overall score)</b>	
A	$93\% \leq x \leq 100\%$
A-	$90\% \leq x < 93\%$
B+	$87\% \leq x < 90\%$
B	$83\% \leq x < 87\%$
B-	$80\% \leq x < 83\%$
C+	$76\% \leq x < 80\%$
C	$70\% \leq x < 76\%$
D+	$66\% \leq x < 70\%$
D	$60\% \leq x < 66\%$
F	$0\% \leq x < 60\%$

***SCHEDULE OF TOPICS***

The rest of the syllabus contains a detailed list of the textbook sections that we will go over in class, as well as exam dates and the sections with which the exams will deal.

<b>Week 1 (January 30 — February 3)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p>Syllabus and course outline.</p> <p><i>Section P.2:</i> “Exponents and Scientific Notation”</p> <p><i>Section P.3:</i> “Radicals and Rational Exponents”</p>	<p>Homework #1, which covers Section P.2 — due on February 13 at 8:00 a.m.</p> <p>Homework #2, which covers Section P.3 — due on February 13 at 8:00 a.m.</p>

<b>February 7</b>
<p><b>Change-of-schedule period ends</b></p> <p><b>Last day to drop a course with no grade posted to academic record</b></p> <p><b>Last day to add a course</b></p>

<b>Week 2 (February 6–10)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p><i>Section P.4:</i> “Polynomials”</p> <p><i>Section P.5:</i> “Factoring Polynomials” (begin)</p>	<p>Homework #3, which covers Section P.4 — due on February 13 at 8:00 a.m.</p>

<b>Week 3 (February 13–17)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p><i>Section P.5:</i> “Factoring Polynomials” (continued)</p> <p><i>Section P.6:</i> “Rational Expressions”</p>	<p><u>Teaching day in the lab.</u></p> <p>Homework #4, which covers Section P.5 — due on February 20 at 8:00 a.m.</p> <p>Homework #5, which covers Section P.6 — due on February 20 at 8:00 a.m.</p>

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<b>Week 4 (February 20-24)</b>	
<p style="text-align: center;"><b><u>Lecture</u></b></p> <p><i>Section 1.2:</i> “Introduction to Relations and Functions”</p> <p><i>Section 1.4:</i> “Equations of Lines and Linear Models”</p>	<p style="text-align: center;"><b><u>Lab</u></b></p> <p><b>Test 1</b> (covers Sections P.2–P.6)</p>

<b>Week 5 (February 27 – March 3)</b>	
<p style="text-align: center;"><b><u>Lecture</u></b></p> <p><i>Section 1.5:</i> “Linear Equations and Inequalities”</p> <p><i>Section 2.1:</i> “Basics of Functions and Their Graphs”</p>	<p style="text-align: center;"><b><u>Lab</u></b></p> <p>Homework #6, which covers Section 1.2 — due on March 6 at 8:00 a.m.</p> <p>Homework #7, which covers Section 1.4 — due on March 6 at 8:00 a.m.</p> <p>Homework #8, which covers Section 1.5 — due on March 6 at 8:00 a.m.</p> <p>Homework #9, which covers Section 2.1 — due on March 6 at 8:00 a.m.</p>

<b>Week 6 (March 6–10)</b>	
<p style="text-align: center;"><b><u>Lecture</u></b></p> <p><i>Section 2.2:</i> “More on Functions and Their Graphs”</p> <p><i>Section 2.3:</i> “Linear Functions and Slope”</p>	<p style="text-align: center;"><b><u>Lab</u></b></p> <p>Homework #10, which covers Section 2.2 — due on March 13 at 8:00 a.m.</p> <p>Homework #11, which covers Section 2.3 — due on March 13 at 8:00 a.m.</p>

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<b>Week 7 (March 13–17)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p><i>Section 2.4:</i> “More on Slope”</p> <p><i>Section 2.5:</i> “Transformations of Functions”</p>	<p><u>Teaching day in the lab.</u></p> <p>Homework #12, which covers Section 2.4 — due on March 27 at 8:00 a.m.</p> <p>Homework #13, which covers Section 2.5 — due on March 27 at 8:00 a.m.</p>

<b>March 20–24</b>
<b>Spring Break: No classes</b>

<b>Week 8 (March 27–31)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p><i>Section 2.6:</i> “Combinations of Functions: Composite Functions”</p> <p><i>Section 2.7:</i> “Inverse Functions”</p>	<p><b>Test 2</b> (covers Sections 1.2, 1.4, 1.5, 2.1, 2.2, 2.3, and 2.4)</p>

<b>Week 9 (April 3–7)</b>	
<b><u>Lecture</u></b>	<b><u>Lab</u></b>
<p><i>Section 3.1:</i> “Quadratic Functions”</p>	<p>Homework #14, which covers Section 2.6 — due on April 10 at 8:00 a.m.</p> <p>Homework #15, which covers Section 2.7 — due on April 10 at 8:00 a.m.</p> <p>Homework #16, which covers Section 3.1 — due on April 10 at 8:00 a.m.</p>

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<b>Week 10 (April 10–14)</b>	
<b><u>Lecture</u></b> <i>Section 3.2: “Polynomial Functions and Their Graphs”</i>	<b><u>Lab</u></b> <u>Teaching day in the lab.</u> Homework #17, which covers Section 3.2 — due on April 17 at 8:00 a.m.

<b>April 10</b>
<b>Last day to withdraw with a grade of ‘W’</b> <b>Last day to change to pass/fail option or audit options</b>

<b>Week 11 (April 17–21)</b>	
<b><u>Lecture</u></b> <i>Section 3.3: “Dividing Polynomials”</i>	<b><u>Lab</u></b> <u>Teaching day in the lab.</u> Homework #18, which covers Section 3.3 — due on April 24 at 8:00 a.m.

<b>Week 12 (April 24–28)</b>	
<b><u>Lecture</u></b> <i>Section 4.1: “Exponential Functions”</i> <i>Section 4.2: “Logarithmic Functions”</i>	<b><u>Lab</u></b> <b>Test 3</b> (covers Sections 2.5, 2.6, 2.7, 3.1, 3.2, and 3.3)

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<b>Week 13 (May 1–5)</b>	
<p style="text-align: center;"><b><u>Lecture</u></b></p> <p><i>Section 4.3:</i> “Properties of Logarithms” <i>Section 4.4:</i> “Exponential and Logarithmic Equations”</p>	<p style="text-align: center;"><b><u>Lab</u></b></p> <p>Homework #19, which covers Section 4.1 — due on May 8 at 8:00 a.m. Homework #20, which covers Section 4.2 — due on May 8 at 8:00 a.m.</p>

<b>Week 14 and 15 (May 8–16)</b>	
<p style="text-align: center;"><b><u>Lecture</u></b></p> <p><i>Section 4.5:</i> “Exponential Growth and Decay; Modeling Data” <i>Section 5.1:</i> “Angles and Radian Measure” <i>Section 5.2:</i> “Right Triangle Trigonometry”</p>	<p style="text-align: center;"><b><u>Lab</u></b></p> <p>Homework #21, which covers Section 4.3 — due on May 17 at 8:00 a.m. Homework #22, which covers Sections 4.4 and 4.5 — due on May 17 at 8:00 a.m.</p>

<b>Final Exam week (May 17–23)</b>
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