

**Math 104****Precalculus: Algebra, Analytic Geometry, and Trigonometry**

**Instructor:** Jeff Beaulieu (please call me Jeff)

**Office:** Lederle Graduate Research Tower (LGRT) 1223 J

**Office Hours:** Monday, Wednesday, Friday 10:00-11:00 and by appointment

**Phone:** (413) 545-6032 (e-mail is best)

**e-mail:** beaulieu@math.umass.edu (please include "Math 104" in your subject heading)

**General Education Requirements:** This is a 3-credit course that will satisfy the R1 (Basic Math Skills) general education requirement for graduation. Please see below for more information about the general education program, in general, and the requirements for R1 and R2 (Analytic Reasoning), specifically.

The General Education Program at the University of Massachusetts Amherst offers students a unique opportunity to develop critical thinking, communication, and learning skills that will benefit them for a lifetime. The purpose of the General Education requirement is to stretch students' minds, broaden their experiences, and prepare them for: subsequent college experiences and professional training; careers and productive lives; community engagement and informed citizenship; a diverse and rapidly changing world; and a lifetime of learning. For more information about the General Education program, please visit the web page

<http://www.umass.edu/gened>.

**How do I satisfy the R1/R2?****1. (R1) Basic Mathematics Skills and (R2) Analytic Reasoning Requirements**

The following courses offered by the Department of Mathematics & Statistics satisfy only the R1 requirement for graduation: Math 011, 012, 100, 101-102 (must have both), 104, 114, 245, 246, 300, 331.

The following courses offered by the Department of Mathematics & Statistics satisfy both the R1 and R2 requirements for graduation: Math 113, 121, 127, 128, 131, 132, 135, 136, 233, 235, 456, and Stat 111, 240, 501, 515, 516.

Note: A continuously updated list of University courses (including courses in other departments) that satisfy R1 and R2 requirements can be viewed here:

<http://www.umass.edu/registrar/students/general-educationacademic-requirements/r1r2-gen-ed-requirements>

## 2. (R1) Basic Mathematics Skills Exemption Exam

The R1 Exemption Exam is not the same as the Math Placement Test. The R1 Exemption Exam is a test of basic math skills only, nothing else. Passing this test will satisfy the R1 requirement for graduation, but will not result in the awarding of any credits. This test is not offered online. It is administered several times each semester through the Department of Mathematics and Statistics. More information about this test (including dates, topics, results) can be found here:

[http://www.math.umass.edu/Undergrad/r1\\_exempt.html](http://www.math.umass.edu/Undergrad/r1_exempt.html)

### **Note: Mathematics Placement Test**

The Math Placement Test is not the same as the R1 Exemption Exam and your score on it does not have anything to do with satisfying your R1 or R2 requirement for graduation. The Placement Test is taken by students online before orientation. Your score on the Placement Test is used only as a guide as to where you currently are in your math ability (whether it be arithmetic or on the doorstep of calculus). The Placement Test is administered through the New Students Program. More information about this test can be found here:

<http://www.umass.edu/newstudent/placement-and-exemption-exams#Placement>

and here: <http://www.umass.edu/newstudent/placement-exam-directions>

**Course Description:** Math 104 covers all of the topics in Precalculus. These include the set of real numbers, absolute value, equations and inequalities in two variables, factoring polynomials, solving rational and radical equations, exponents, functions, slope of a line, solving linear and quadratic equations, one-to-one functions, inverse functions, exponential and logarithmic functions, conic sections (parabolas and circles), and trigonometric (circular) functions and their inverses. Other topics may also be covered if time allows.

**Course Topics:**

1. Sets of Numbers
2. Linear Equations and Inequalities
3. Graphs and Functions
4. Systems of Equations
5. Polynomials and Polynomial Functions
6. Rational Expressions
7. Rational Exponents, Radicals
8. Complex Numbers
9. Quadratic Equations and Functions
10. Exponential and Logarithmic Functions
11. Conic Sections
12. Trigonometric Functions
13. Analytic Trigonometry

**Learning Objectives:**

Upon successful completion of the course, students will be able to:

1. accurately solve first and second degree, radical, absolute value equations and inequalities in one variable.
2. use basic coordinate geometry formulas and graph linear equations and inequalities.
3. accurately solve a system of two linear equations in two variables
4. accurately add, subtract, multiply and factor polynomial expressions
5. accurately simplify, add, subtract, multiply and divide rational expressions
6. accurately solve equations containing rational expressions
7. apply the rules of integer and rational exponents to both real numbers and algebraic expressions.
8. accurately simplify, add, subtract, multiply and rationalize radical expressions
9. demonstrate an understanding of complex numbers and perform fundamental operations within this system.
10. demonstrate a basic understanding of a function, its inverse, composition, and notation.
11. accurately identify and apply properties of logarithmic and exponential functions and their graphs.
12. accurately identify the equations, properties and graphs of the parabola and circle.
13. convert between radian measure and degree measure and apply to arc length.
14. demonstrate the ability to use trigonometric functions to find the parts of a right triangle and to solve problems involving right triangles.
15. demonstrate an understanding of the location of angles in standard position on the unit circle, along with their trigonometric function values on any size circle.
16. accurately identify the properties and graphs of the six trigonometric functions and their inverses.
17. accurately verify trigonometric identities

**Moodle Course Webpage:**

The Moodle course webpage contains the syllabus, the lecture schedule of topics (includes exam dates), and the course topics list. Exam grades will be posted here, as well. Also, see the note below about the news forum. To access our Moodle course page, follow the link:

<https://moodle.umass.edu/>

Sign in using your net ID and password. This brings you to your main Moodle page. Each course you are taking this semester that has a Moodle course page will have a link. Click on the Math 104 link.

**Note:** I will send you messages through Moodle throughout the semester. These messages will go to your UMass e-mail address. All messages sent will also be saved in the “news forum.” A link to the news forum should be visible at the top of the Moodle course webpage.

**Calculator:**

A calculator will be useful during class and while working through some homework problems. A graphing calculator is not necessary. A scientific calculator will do (has buttons for sin, cos, tan, log, ln). However, calculators will not be allowed for use on any exam.

**Course Materials:**

This course uses a textbook and an online homework system. Students are required to purchase access to the online homework system. An electronic version of the textbook is accessible through the online system, so it is not necessary to purchase a hard copy of the textbook. Because some students prefer to have a hard copy, it is possible to purchase one either separately or as part of a package with an access code to the online system. Several copies of the textbook are available at the reserve desk in the university library (one floor below the main entrance floor). When requesting a reserve copy, please provide the person at the desk with the following identifying information: BL69B

**Note:** Please see the Spire/amazon.com textbook website for ISBNs for each option below.

- 1) (optional) Textbook: *Algebra and Trigonometry* by Robert Blitzer, fifth edition. Pearson. 2014.
- 2) **(required)** My Math Lab Access: (online homework and e-book) Homework will be assigned through My Math Lab (MML). MML is an online homework system. Access includes an electronic version of your textbook (e-book).

**Registering for My Math Lab:**

To register for MML, you will need two items. First, you will need the MML course number: **beaulieu13393**. Second, you will need to purchase long-term MML access. This can be a code consisting of a long string of capital letters you buy packaged with a book (or separately), or you can purchase access while registering on [mymathlab.com](http://mymathlab.com). See below for more details on the MML registration process.

**Note:** If you already have an MML account for which you previously (within the last 36 months) purchased long-term access and that was then attached to the book for this course (i.e. if you've taken Math 101, 102 or 104 before with this book), then you will not need to purchase access again. Simply log into your existing MML account and click on the "enroll in another course" button. Then, enter the MML course number for this section of Math 104.

**Purchasing MML Access and the Textbook:**

If you'd like a new hard copy of the book, check the textbook section on Spire/amazon for the ISBNs for the available textbook/MML access packages (I believe there are hard cover and loose leaf versions). The Mathematics and Statistics Department has negotiated with Pearson (the textbook company) to get UMass students a special price for these packages. There are specific ISBNs to go with these special prices (not the same ISBNs that are assigned to the textbook, in general). These prices, along with the special ISBNs should be visible on the amazon course materials page. Once you have the ISBNs, you can search other places for the best price on these course materials. You may be able to find an inexpensive, used, hard copy of the book elsewhere. The MML access price should be \$75 if you purchase it either on [amazon.com](http://amazon.com) or while registering on [mymathlab.com](http://mymathlab.com). Otherwise, you may pay more. The easiest way to purchase access to MML (includes the e-book) is to go to [mymathlab.com](http://mymathlab.com), register as a student, and purchase your access during the registration process. Remember, there are several hard copies of the textbook on reserve at the library, as well.

Temporary MML Access:

It's important to register on the website and begin your assignments as soon as possible. If you cannot presently afford the long-term access, or if you are unsure if you will be staying in this course, there is an option to register, initially, for **free temporary access** on the [mymathlab.com](http://mymathlab.com) website. If you choose to register for this temporary access, you'll need to purchase long-term access and update your registration within twenty days to retain/regain access to the assignments (see instructions on the [mymathlab.com](http://mymathlab.com) website). All work done on the assignments up to that point will be saved automatically.

**Working on Problems in MML:**

One of the benefits of using MyMathLab is that you will have the opportunity to try homework problems multiple times. Occasionally, a syntax issue may arise while working on these problems (the system isn't perfect), but multiple attempts on a problem and a reading of the specific directions for the problem should help. MML automatically saves all work that has been done on a problem, so you don't have to.

When you first encounter a problem to do in MML, you work out the answer (perhaps on paper) and then enter your answer in the provided space. Click on "check answer." If it's correct, you get a green check mark, and you can attempt the next problem on the assignment. Be mindful that you can always click on the "similar problem" button to get a fresh problem if you'd like more practice (you don't lose your green check mark if you do that similar problem incorrectly... once you get that problem correct once, it stays as a green checkmark).

If, however, you answer the original problem incorrectly, then you see a red X and possibly a hint. You can then try that same problem again. If you get it wrong a second time, then, again, a hint (often the same hint) is displayed. You can then try it a third time. If you get it wrong on the third attempt, then it gives you the answer. You may then click on "similar problem" for a fresh problem of the same type with three new attempts. Including the original problem, you have five fresh problems per question number. That means fifteen attempts for each question. If you're not having success after a couple of fresh problems, print out the question and seek help from the TAs in the Help Center (schedule will be posted on Moodle when ready) or from me during my office hours (on the syllabus) before exhausting all of your fresh problems.

My Math Lab will operate on a PC or a Macintosh computer. If you do not have your own, you will be able to access MML on all IT (Information Technologies) computers on campus. Look here to find these IT computers:

<http://www.it.umass.edu/computer-classrooms/it-computer-classroom-locations>

If you ever have any technical problems with MML, call IT **(413-545-9400)** or the My Math Lab student help line **(1-800-677-6337)**.

**Homework:**

Homework will be assigned and completed through My Math Lab (see above). Due dates are visible next to each open assignment on MML. A group of assignments will open when we begin discussing that material in class. The assignments in that group will be due before the exam which covers the material in those assignments. It's your responsibility to be aware of the due date for each assignment, and it's strongly recommended that you keep up with the assignments as we discuss the material in class. Extensions will be granted only for compelling reasons (e.g.: students with documented accommodations, documented medical situations, documented technical issues).

**Note:** Again, I highly recommended that you do the assignments as the material is discussed in class. It is easy to get overwhelmed by assignments that pile up for whatever reason. Assignments are expected to be done BEFORE the exam that covers that material. Assignments are intended to help you understand and practice the concepts that will be tested. Extensions will not be granted for assignments just because they pile up and become overwhelming. Please plan accordingly. Assignments that are not completed by their respective due dates may still be completed after their due dates with a fifty percent penalty.

**Exams:**

There will be three semester exams and a final exam. All exams will follow a multiple-choice format. Calculators will not be allowed on any exam. Please be sure to arrive early to the exams so you'll have as much time as possible to complete them. At each exam, you will need to bring a #2 pencil and your UMass student ID card.

Acceptable reasons for missing an exam are listed below in the exam make-up policy. Please be mindful that most known conflicts require at least a two weeks advanced notice to the instructor. Students are responsible for being familiar with the exam make-up policy (see below).

Semester Exams: The three semester exams will be given in class. Students are responsible for knowing the date of each exam (see the Semester Schedule in this syllabus packet and posted on our Moodle course page). Make-up exams will not be given because of conflicting travel plans. Please plan accordingly.

Final Exam: The cumulative final exam has been scheduled by the Registrar's Office and is posted in your Spire account (possibly under your course schedule). Check the Final Exam Schedule for the day, time, and location of our exam. Make-up exams will not be given because of conflicting travel plans. Please plan accordingly.

**Exam Make-up Policy:**Final Exam Conflict:

If you find you have another final exam scheduled for the same time as ours, or if you have three final exams scheduled for the same day, then you should seek guidance from the Registrar's Office on how to resolve these issues. Please provide me with documentation of your conflict from the Registrar's Office at least two weeks in advance of the exam.

The following are examples of acceptable reasons for missing an exam. The proper documentation must be provided in the prescribed time frame to be afforded a make-up exam.

Official University Travel:

Personal travel is not an acceptable reason for missing a scheduled exam. If you will be traveling for university business (e.g. athletic competition or an academic conference), then you will need to notify your instructor **at least two weeks before the exam** and provide official documentation of this.

Medical Reasons:

Absence from an exam due to medical reasons can be planned or unexpected. If planned, you will need to notify your instructor of this **at least two weeks in advance of the exam**. If unexpected, you will need to contact your instructor as soon as possible after the missed exam. In either case, you will need to provide documentation from a medical professional with a telephone number where the professional can be contacted if necessary. You need not disclose any details of the reason for a medical excuse, but there must be enough information to allow the absence to be excused.

Religious Observances:

State law and University regulations require that a student be excused from academic pursuits on days of religious observance. The regulations also require the student to notify the instructor, in writing, **at least one week before the absence** or it may not be excused.



**Course Grade:**

There are five graded parts to this course (20% each): the three semester exams, the final exam, and the MML online homework. In addition, you will have an opportunity to earn bonus points. More on this below...

During the semester, exam grades will be posted on the Moodle course webpage, and homework will be recorded on MML. At the end of the semester, *all* grades (exam scores, homework average, and bonus points) will be posted on the Moodle course webpage.

**Bonus Points:**

Class Exercises: Through class exercises, you will have the opportunity to earn up to five bonus points which will be added onto your final course average.

During each lecture meeting, there will be a problem for you to work on as a way to provide some practice thinking about the material. It's the effort and the process that count on these, not the final answer. Credit for these will be earned based on your effort. Little effort shown on these receives no credit. These will be collected, but not returned. After collection, I will go over the exercise with you to be sure you leave with the correct solution. These cannot be made up. The system is set up so you can miss a few and still earn the maximum number of bonus points.

At the end of the semester, I will divide the total number of class exercises for which you have earned credit by the total of exercises given. If you have earned credit for at least 90 percent of the exercises given, then you will receive five bonus points. At least 80 percent but less than 90 receives four points. At least 70 percent but less than 80 receives three points. At least 60 percent but less than 70 receives two points. At least 50 percent but less than 60 receives one point. Less than 50 percent receives no points. Please take advantage of this opportunity to boost your course grade. The more effort you put into this course, the better you should do on the exams, the higher your course grade should be.

**Letter Grades:**

Course grades will be assigned based on the following scheme:

**Percentage Letter Grade**

89.5-100	A
86.5-89.49	A-
82.5-86.49	B+
78.5-82.49	B
74.5-78.49	B-
70.5-74.49	C+
66.5-70.49	C
62.5-66.49	C-
58.5-62.49	D+
54.5-58.49	D
54.49 and below	F

**HELP RESOURCES:**

1. **Precalculus Help Center (LGRT 146):** Please take advantage of this free, helpful resource if you're having difficulty with course material. It is staffed by TAs who sit in on the class. The complete Help Center schedule will be posted on the Moodle when it is finalized.

2. **Learning Resource Center (LRC):** The Precalculus Help Center will only be open during the day. For help during the evening, please consult the tutoring schedule of the Learning Resource Center on the tenth floor of the W. E. B. Du Bois University Library. These tutors do not sit in on the class, but they are still a good resource for help with the course material. The url for the LRC is:

<http://www.umass.edu/lrc/index.html>

**Student-Athletes:** Student-athletes are required to provide a schedule of competition to the instructor within the first week of class. Absences for students involved in a varsity sport due to competition are excusable (absences due to practice, club sports, and intramural sports are not). Be sure to highlight any dates on the schedule that conflict with exam dates. Also, be sure to highlight your name on the schedule.

**Students Needing Accommodations:** If you have a documented disability, and you are in need of accommodations, please talk to me as soon as the semester begins. You will be asked to provide documentation through the Office of Disability Services. All exams will be taken with me at alternate times to accommodate those who need extra time and a distraction reduced environment. Please do not schedule your exams with Disability Services.

**Disruptive Behavior:** The large lecture format of this course is unfortunate but necessary due to the number of students who take it. Part of my job is to ensure a distraction free learning environment for all students, and I appreciate your cooperation in this regard. To this end, cell phones, ear phones, laptops, newspapers, food, and private conversations are not welcome in class. A student who exhibits repeated disruptive behavior in class will be invited to leave. You are not required to attend lecture, but I strongly encourage you to do so. I believe it will help you greatly in understanding the material and preparing you for the exams.

**Academic Honesty:** Cheating will not be tolerated, and violators will be prosecuted through the Provost's Office. Cheating is when you submit work that is not your own or when you help others to do so. Penalties can be failure of the course, academic probation, suspension, and expulsion. There's plenty of help available in this course. Please seek it out early and often.

**Drops, Withdrawals, Pass/Fail Option, Incompletes:** Consult the semester schedule for the last day to drop the course with no record (end of add/drop) and the last day to withdraw from the course (only a "W" will appear on your transcript).

Contact the Registrar's Office for information regarding how to take the course using the Pass/Fail option.

A grade of "Incomplete" can be given only for a compelling reason (e.g. serious illness). To receive an incomplete, you must be passing the course.