

MATH 118

MATH FOR THE NATURAL SCIENCES



SPRING 2022

MTWF 8:00-8:50

HIRT 103

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Office Hours: Monday 2 - 3 pm
Tuesday 9 - 10:30 am and 1 - 2:30 pm
Wednesday 2 - 3 pm
Friday 1 - 2 pm
and by appointment

Course Description

This course has been designed for students who plan to take calculus but may be deficient in some aspects of their mathematical preparation. While many of the topics covered are similar to those covered in a typical college precalculus course, there is more emphasis on the application, a faster pace is maintained, and a greater depth of understanding is required.

The course will cover the fundamental concepts of college algebra, precalculus, and a preparation for calculus. Topics will include factoring, integer and rational exponents, simplifying algebraic expressions, solving equations and inequalities, basic trigonometry, function notation, polynomial and rational functions, exponential and logarithmic functions, trigonometric and inverse trigonometric functions, graphs of functions and applications.

Course Objectives

Upon successful completion of this course, a student will be prepared to succeed in calculus and subsequent sciences courses. In particular, students will be able to:

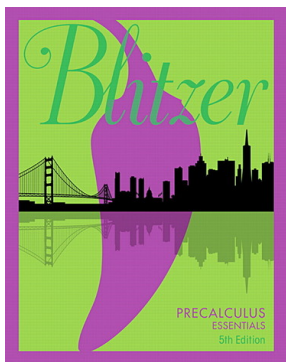
- demonstrate a working knowledge of the basics of the language of mathematics,
- have acquired study habits necessary for continued success in your subsequent science and mathematics courses,
- apply your understanding of algebra as required in both calculus and applications in sciences,
- organize all of your mathematical tools, techniques, procedures, and problem solving skills further developed in this course. This will enable you to utilize the appropriate tools to restate, setup, and then solve problems in calculus and beyond,
- continue to develop your mathematical skills and thought processes subsequent to this course, given the solid foundation you built in this course.

Prerequisites

To remain enrolled in this course, you must satisfy at least one of the following criteria:

- Score of 50 or better on the ALEKS Mathematics Placement Assessment
- Passed Math 111 (College Algebra), or transfer credit for equivalent

If none of these apply, you should make arrangements to take the ALEKS Math Placement Assessment before the Add/Drop deadline on January 21st. **Students that do not meet the prerequisites by this deadline may be dropped from the course.**



Required Textbook

Precalculus Essentials by Robert Blitzer, 5th Edition. If you have a different edition of the textbook, it is up to you to make sure the sections and assigned problems are the same. A similar text, simply called “Precalculus”, has the same material along with a few additional sections and can also be used for this course.

You will not be expected to bring your textbook to class. If you prefer to purchase or rent an electronic version of the text, you are welcome to do so.

No other materials are required for this course.

Course Components

Homework

A list of all recommended homework problems from the textbook is included in this syllabus. While your work for these problems will not be collected, practicing the material as much as possible is the best (and only) way to learn it. You are strongly encouraged to work through additional problems as well. You should plan to spend approximately 8-12 hours per week on studying for this course outside the classroom based on the suggested 2-3 hour per credit rule.

Stay up to date with homework, and get help if you cannot understand a problem after trying it on your own. Don't ignore a problem that you are struggling with! Our class is focused on the foundations of mathematics that you will need in this course and any future mathematics and science courses. A weak spot in this foundation will lead to a bigger problem in the future.

If you're stuck on a homework problem, please let me know. I can help in class, via email, or in office hours, and I'd be happy to create additional notes or videos to explain a tricky problem or topic. I will post any such materials to the course site on Blackboard for the benefit of all students in the class.

Quizzes

Keeping up with the homework will ensure that you are prepared for the quizzes, which will feature problems very similar to those in the homework as well as more conceptual questions about the topics you'll see each week.

There will be a total of 10 quizzes during the semester. Your lowest quiz grade will be dropped when calculating your final grade, including a missed quiz (so only your best 9 quiz grades will be counted towards your final grade).

Exams

We will have four unit exams and a cumulative final exam. Exams will be given in class. No calculators or other electronic devices will be permitted on exams.

Your lowest exam grade, including a missed exam, will be replaced by your final exam grade (if better). This policy **does not** apply to exam grades of 0 due to academic dishonesty.

Exam 1	Tuesday, February 15	Chapter P
Exam 2	Tuesday, March 15	Chapter 1
Exam 3	Tuesday, April 12	Chapters 2 and 3
Exam 4	Tuesday, May 3	Chapters 4 and 5
Final Exam	Monday, May 9 (8-10 am)	All Sections

Grades

Your final grade will be calculated as follows:

Component	Total Value
Quizzes (9 best)	30%
Exams (4)	50%
Final exam	20%

Mathematics Department Grade Scale:

Grade	F	D	D+	C	C+	B	B+	A
Percentage	0-59	60-69	67-69	70-76	77-79	80-86	87-89	90-100

Other Policies

Missed Class

You do not need to let me know if you'll have to miss class. Just make sure you keep up to date with the schedule, ask a classmate what you missed in class, and attend office hours if you have more questions.

Missed Quiz/Exam

If you know in advance that you will not be able to take a quiz or exam on the day it is scheduled, please discuss with me to make arrangements for an alternative time. Make up quizzes or exams will not be given for undocumented reasons unless arrangements are made in advance. However, keep in mind that a single missed quiz will be dropped from your final grade, and a missed exam will be replaced by your final exam grade.

Email

I will attempt to respond to emails promptly. For your own protection, please use your Mercyhurst email address. Emails received after 6 pm may not receive a reply until the next business day. If you have not received a response from me in over 24 hours on a weekday, feel free to send another - I may have missed your first message.

Books

The textbook we are using is the 5th edition of *Precalculus Essentials* by Robert Blitzer. If you are able to find the 4th edition for a lower price, that will work fine for the class (just note that the page numbers on the homework list will be off a bit). An edition of *Precalculus* by Robert Blitzer is also fine, as it's the same material with a few additional chapters.

Extra Credit

Out of fairness to all students in the class, there are no extra credit opportunities to improve your final grade that are not extended to the entire class.

ADA and Learning Differences

Mercyhurst University is committed to making reasonable accommodations for qualified students, and employees with disabilities as required by law. Please refer to the HUB

<https://lakersmercyhurst.sharepoint.com/sites/StudentsHub>

and select the Services tab, then ADA Accommodations from the dropdown for instructions to request an accommodation. You may also contact Susan Reddinger, ADA Coordinator, ADA@mercyhurst.edu, 814-824-2362, Egan Hall 200. For students with questions about Academic Support, please refer to the HUB

<https://lakersmercyhurst.sharepoint.com/sites/StudentsHub>

and select the Academic Resources tab, then Academic Support for more information.

Title IX Information

Mercyhurst is committed to providing an environment free from sex discrimination, including sexual harassment and sexual violence. Please refer to the HUB:

<https://lakersmercyhurst.sharepoint.com/sites/StudentsHub>

and select the Resources tab, then Title IX – Sexual Respect from the dropdown for more information. If you would like to file a sexual misconduct complaint, please contact Ann Miller, Title IX Coordinator and Compliance Officer, titleix@mercyhurst.edu, 814-824-2363. Please be aware that in compliance with Title IX, educators must report incidents of sexual assault/harassment, stalking, and domestic/dating violence. If you disclose any of these situations in class, in papers, or to me personally, I am required to report it to the Title IX Coordinator (or any of the Deputy Title IX Coordinators).

Course Evaluations

Near the end of the semester, you will be asked to complete an online course evaluation. The evaluation will be completed in class during the last two weeks of the semester using any laptop, tablet, or mobile device. The response tool allows you to note aspects of the course that helped you learn, as well as aspects that might be modified to help future students learn more effectively. You will receive an email letting you know when the evaluation window for our class is open. Please note that these course evaluations are anonymous and instructors do not see the results until after the grades for the course are submitted.

Covid

First Week

Our first week of classes for the Spring 2022 semester will be held remotely. Links to join the Zoom meeting will be posted on Blackboard. Additional changes to our schedule may be made according to updated University policies.

Masks

University policy requires all individuals to wear face coverings while indoors on campus. Masks are not required while sitting alone at your office desk or while eating.

Food and Drink in the Classroom

In light of the COVID-19 situation, eating is not permitted in classrooms, labs, or other academic spaces. A water bottle or cup with a lid (and preferably a straw) is permitted to be used in classrooms and labs to help prevent a student from becoming dehydrated. Masks should be pulled only slightly away from the bottom of the face to take a quick drink and immediately replaced to cover the mouth and nose.

Math 118 Spring 2022 Semester Schedule

Monday	Tuesday	Wednesday	Friday
<i>Jan 17</i> <i>MLK Day, No Class</i>	Jan 18 Course Intro	Jan 19 Section P.1	Jan 21 <small><i>Add/Drop Deadline</i></small> Sections P.1/P.2
Jan 24 Section P.2	Jan 25 Section P.3	Jan 26 Sections P.3/P.4	Jan 28 Quiz Section P.4
Jan 31 Section P.5	Feb 1 Section P.5	Feb 2 Section P.6	Feb 4 Quiz Section P.6
Feb 7 Section P.7	Feb 8 Section P.7	Feb 9 Section P.9	Feb 11 Quiz Section P.9
Feb 14 Sections 1.1/1.2	Feb 15 Exam 1	Feb 16 Sections 1.2/1.3	Feb 18 Sections 1.4/1.5
Feb 21 Sections 1.5/1.6	Feb 22 Section 1.6	Feb 23 Section 1.7	Feb 25 Quiz Section 1.8
Feb 28 Sections 1.8/1.9	Mar 1 Section 1.10	Mar 2 Section 1.10	Mar 4 Quiz Sections 2.1/2.2
<i>Mar 7</i> <i>Spring Break</i>	<i>Mar 8</i> <i>Spring Break</i>	<i>Mar 9</i> <i>Spring Break</i>	<i>Mar 11</i> <i>Spring Break</i>
Mar 14 Review/Catch Up	Mar 15 Exam 2	Mar 16 Section 2.2	Mar 18 Section 2.3
Mar 21 Sections 2.3/2.4	Mar 22 Section 2.4	Mar 23 Section 2.5	Mar 25 Quiz Section 2.6
Mar 28 Section 2.6	<i>Mar 29</i> <i>Advising Day</i>	Mar 30 Section 2.7	Apr 1 Quiz Section 2.7
Apr 4 Sections 3.1/3.2	Apr 5 Sections 3.2/3.3	Apr 6 Section 3.4	Apr 8 Quiz Section 3.4
Apr 11 Section 4.1	Apr 12 Exam 3	Apr 13 Section 4.2	<i>Apr 15</i> <i>Easter Break</i>
<i>Apr 18</i> <i>Easter Break</i>	Apr 19 <small><i>Withdrawal Deadline</i></small> Section 4.3	Apr 20 Section 4.4	Apr 22 Quiz Section 4.5/4.6
Apr 25 Section 4.7	Apr 26 Section 4.7	Apr 27 Section 5.1	Apr 29 Quiz Section 5.1
May 2 Section 5.5	May 3 Exam 4	May 4 Review	May 6 Review
May 9 Final Exam 8-10 am	<i>May 10</i>	<i>May 11</i>	<i>May 13</i>

Homework List

Your homework will not be collected, but these problems (and similar questions) are likely to appear on quizzes and exams. Answers to most of the questions are available in the back of the textbook. Working on additional problems is highly recommended.

Sec.	Page	Problems
P.1	17	9, 11, 15, 20, 21, 25, 29, 31, 43, 49, 57, 59, 69, 91, 93, 95, 99, 101, 107, 109, 111, 113, 115, 117, 119, 159, 160
P.2	30	1, 3, 5, 12, 21, 29, 33, 37, 39, 41, 43, 47, 51, 55, 57, 59, 61, 63, 65, 67, 107, 109, 111, 113, 143, 145
P.3	45	1, 3, 5, 11, 13, 21, 25, 29, 31, 35, 37, 41, 43, 47, 49, 51, 53, 61, 65, 71, 73, 79, 81, 87, 89, 91, 93, 95, 97, 99, 101, 103, 107, 109, 111, 113, 119
P.4	56	13, 17, 21, 29, 39, 45, 51, 65, 69, 77, 85, 87, 89, 93, 95, 107, 109, 111, 113
P.5	68	11, 13, 15, 23, 29, 37, 41, 45, 47, 55, 59, 65, 71, 79, 83, 93, 97, 103, 117
P.6	84	5, 9, 15, 17, 27, 29, 33, 39, 41, 43, 51, 53, 55, 56, 63, 65, 67, 69, 71, 72, 73, 75, 79, 80, 81, 83, 85, 87, 107, 117
P.7	105	11, 15, 21, 25, 35, 37, 39, 41, 47, 51, 71, 73, 75, 79, 91, 99, 101, 103, 105, 107, 109, 111, 113, 115, 121, 123, 127, 131, 167, 169
P.9	137	5, 15, 27, 31, 33, 41, 51, 55, 59, 65, 73, 75, 77, 79, 81, 91, 95
1.1	158	23, 55, 57, 59, 79-82, 83-86
1.2	176	13, 15, 29, 33, 35, 43, 45, 59, 61, 62, 71, 73, 75, 81, 87, 89, 93, 95, 122-125, 126
1.3	195	1, 3, 5, 11, 13, 39, 45, 47, 51, 53, 61, 63, 77, 85, 87, 89, 90, 91, 92
1.4	213	7, 15, 27, 31, 33, 37, 43, 59, 67, 85
1.5	225	1, 5, 9, 11, 25, 29, 41
1.6	241	17, 19, 21, 23, 27, 33, 35, 36, 45, 47, 52, 53, 55, 57, 59, 67, 69, 71, 77, 146, 147, 151, 152
1.7	258	9, 27, 35, 53, 59, 63, 67, 73, 75, 83, 85, 91, 93, 95, 96, 124
1.8	269	3, 5, 7, 17, 19, 25, 27, 28, 29-34, 35, 37, 53, 55, 57, 59, 63
1.9	280	43, 49, 53, 55, 57, 63
1.10	291	15, 18, 19, 23, 25, 27, 31, 33, 39, 41, 44, 46, 64, 65, 66
2.1	314	5, 7, 17, 21, 27, 37, 51
2.2	330	1-4, 5-8, 11, 17, 31, 39, 41, 57, 65, 71
2.3	348	3, 5, 7, 9, 13, 15-18, 23, 25, 27, 31, 37, 43, 47, 57, 67, 69
2.4	363	9, 11, 13, 15, 27, 29, 43, 44, 45
2.5	377	23, 24, 25, 27, 29, 43, 45, 46, 47, 49, 53, 58
2.6	398	5, 7, 15-20, 25, 27, 29, 31, 37, 39, 49, 57, 65, 95
2.7	412	17, 25, 27, 35, 37, 39, 41, 43, 53, 55, 61, 63, 65, 67, 69
3.1	448	19-24, 35, 39, 41, 52, 61, 63, 64, 73, 88, 90, 91, 93
3.2	463	1, 7, 9, 13, 21, 23, 27, 33, 43, 47-52, 65, 73, 83, 85, 87, 89, 91, 93, 97, 99, 101, 107, 109, 111, 151
3.3	475	5, 9, 13, 29, 30, 37, 41, 57, 68, 69, 83, 88, 93, 94, 96, 97, 99, 137
3.4	488	5, 9, 16, 19, 21, 22, 33, 37, 41, 43, 45, 63, 71, 75, 79, 83, 87, 89, 91, 93, 95, 97, 99, 101
4.1	532	15, 19, 25, 29, 41, 43, 45, 47, 63, 65, 69, 77, 80, 81
4.2	547	3, 5, 7, 17, 19, 23, 31, 35, 41, 55, 57, 59, 63, 67, 71, 77, 107
4.3	560	1, 7, 9, 11, 19, 29, 33, 35, 53, 55, 56, 57
4.4	575	1, 9, 11, 13, 16, 19, 25, 29, 31, 66, 67, 78, 85, 87, 91, 93, 95, 99
4.5	595	5, 11, 39, 57, 61, 65, 66
4.6	609	1, 2, 3, 4
4.7	626	1, 9, 11, 15, 25, 29, 33, 35, 39, 41, 43, 45, 55, 57, 61, 63, 65, 67, 71, 79
5.1	658	13, 21, 25, 27, 29, 32, 35, 37, 41, 43, 45, 47, 49, 51, 54, 55, 57, 59, 67
5.5	703	9, 23, 25, 27, 39, 45, 67, 99, 100, 101, 105, 106, 113, 115, 117, 160