

**UNIVERSITY OF DELAWARE**  
**DEPARTMENT OF MATHEMATICAL SCIENCES**

**Math 117**  
**Precalculus for Scientists and Engineers**  
**Fall 2009**

**Textbook:** *Precalculus, Understanding Functions*, by Goodman and Hirsch, second edition, Brooks/Cole, ISBN 0-534-38635-0

**Calculators:** A scientific calculator is required - a graphing calculator is not permitted on exams. Calculators are frequently useful tools for demonstrating concepts and checking algebraic work. However, to receive credit for a problem on an exam or quiz, unless otherwise indicated, you will need to show all proper algebraic steps.

**Course Description:**

This course is designed to prepare you for Math 241 Analytic Geometry and Calculus A. If you are not enrolling in Math 241 next semester, please check with your advisor to ensure that this is the correct course.

This is four-credit course and each section meets four times weekly.

We first have a brief but demanding algebra review, including rules of exponents and solving various kinds of equations and inequalities. Then there is the in-depth study of the concept of functions. We will begin by studying linear, quadratic, polynomial, rational, and radical functions. We will also review systems of equations. Then we will study trigonometric functions, identities, applications, etc. We will end the course by studying exponential and logarithmic functions. Both algebraic and graphical techniques will be used through the course.

There is a complete list of topics, along with the homework assignments, at the end of this syllabus.

**Attendance:** Class attendance and participation in class are important for you in learning the concepts and techniques presented. So don't miss class, but if you do have to, please get the class notes (from someone in your class), read the book and try to catch up as soon as possible. You are certainly welcome to see me for office hours if you have questions.

**Additional Resources:**

Please make use of the resources available to you to ensure your success in this course.

1. Instructor office hours
2. The Department of Mathematical Sciences Tutorial Site (106 Ewing Hall)
3. Textbook (including accompanying CD)
4. The Academic Enrichment Center (148 – 150 S. College Avenue) for a list of private tutors. These tutors are not hired by the University. Fees must be negotiated between the student and the tutor. Also, based on interest, group tutorial sessions will be set up free of charge.

**Exams:** All sections of Math 117 students will take the same semester exams at the same time. These exams will be held from 5:00 pm to 6:45 pm on the Friday evenings shown below. You should be in your assigned room by 4:45 pm. Your room assignment will be announced.

**Exam Dates and Tentative Sections Covered for Each Exam**

Exam 1: Friday, September 25	Chap 1 and sections 2.1-2.3
Exam 2: Friday, October 23	Sections 2.4-2.6, Chap 3, Sections 4.1-4.2
Exam 3: Friday, November 20	Sections 4.3-4.6, 9.1, 10.7, 6.1-6.4, 7.1 – 7.5

**IMPORTANT!!** These are the only days and times the exams are given. You **MUST** be present for each exam. The exam dates and times are not negotiable. It is your responsibility to ensure that you have no scheduling conflicts.

*Students who have a verified and approved university excuse for missing a regularly scheduled course hour exam will have that score replaced by the average of the percentage scores of all other hour exams and the final exam. You must notify your instructor immediately of such a conflict.*

**Final Exam:** The final is also common for all sections. It will be scheduled by the University during finals week, Friday, December 11 – Friday, December 18.

**Please do not make your travel arrangements for the holidays until you know when all your final exams are scheduled.**

The final is cumulative. It covers all the sections listed in the Homework Assignments at the end of this syllabus, including sections that are covered after the third exam.

**Points:** You will earn points as follows:

Three Semester Exams (125 points each)	375
Final Exam	200
Instructor Designated Points	<u>125</u>
<b>Total</b>	<b>700 points possible</b>

**Grade:** The number of points you accumulate during the semester, using the following scale, will determine your grade. **Important!!** No extra credit or other special grading arrangements will be made. Grades will not be curved

Grade	Total Points	Percent	Grade	Total Points	Percent
			C+	518 - 538	74 – 76
A	630 - 700	90 – 100	C	490 - 517	70 – 73
A-	609 - 629	87 – 89	C-	469 - 489	67 - 69
B+	588 - 608	84 – 86	D+	448 - 468	64 – 66
B	560 - 587	80 – 83	D	420 - 447	60 – 63
B-	539 - 559	77 – 79	D-	399 - 419	57 – 59
			F	Below 399	Below 57

**PLEASE NOTE:** The last day to drop this class without academic penalty is **October 27, 2009.**

Some Suggestions for Success:

- Read the section in the book before attempting the homework problems. If you do not understand a topic, you might try actually writing out some of the examples.
- Refer to your class notes. Your class notes will provide you with carefully selected examples of the important topics in each text section.
- There will not always be time during class to go over all homework problems that you may have questions about. You own the responsibility to get help as soon as a problem arises. You can make an appointment for office hours. Or perhaps going over homework with someone else in class would work for you.
- You can try going to the “Tutoring Room”, 106 Ewing. Limited, but free tutorial assistance is available there. No appointment is necessary. Solution manuals are also available for you to look at in the room, by checking out with your ID. Some very successful students schedule specific times for themselves to go there and do homework.  
The Tutoring Room is usually open from about 10:00am to 8 pm, but not on weekends. I will announce the exact hours when they are determined.

**Academic Honesty:** The following statement is from the Student Guide to University Policies.

*“All students must be honest and forthright in their academic studies. To falsify the results of one’s research, to steal the words or ideas of another, to cheat on an assignment, or to allow or assist another to commit these acts corrupts the educational process. Students are expected to do their own work and neither give nor receive unauthorized assistance. Any violation of this standard must be reported to the Office of Judicial Affairs.”*

**Also included in the Student Guide is a statement about cheating. The policies in detail are at:**  
<http://www.udel.edu/stuguide/06-07/code.html - honesty>

**Homework:** There is a list of homework problems at the end of the syllabus. You should complete as many of the problems as you can in the appropriate section(s) before the next class.

***Doing all the homework on a timely basis is the most important thing you can do to help yourself learn the course material and be successful on the exams.***

**HOMEWORK ASSIGNMENTS** (Any changes in the assignments will be announced in class.)

<i>Section</i>	<i>Page</i>	<i>Topic Description</i>	<i>Problem Assignment</i>
<b>Chapter One</b>			
1.3	27	<i>Polynomials and Rational Expressions</i>	17-61 odd, 69-89 odd, 90-92
1.4	41	<i>Exponents and Radicals</i>	3, 5, 7, 13, 15, 21-25, 27-30, 33-41 odd, 45-48, 53, 63-79 odd
1.6	55	<i>First Degree Equations and Inequalities in one Variable</i>	17-25 odd, 28, 33-36, 39, 41
1.7	62	<i>Absolute Value Equations and Inequalities</i>	9-21 odd, 31-37 odd
1.8	69	<i>Quadratic Equations and Equations in Quadratic Form</i>	5-21 odd, 39-42, 43-55 odd
1.9	74	<i>Quadratic and Rational Inequalities</i>	11-47 odd
1.10	78	<i>Substitution</i>	1-10, 13, 15-20, 23, 25-28, 30, 33, 34
<b>Chapter Two</b>			
2.1	100	<i>The Cartesian Coordinate System: Graphing Straight Lines and Equations of Circles</i>	3, 5, 9, 10, 19, 25, 27, 29, 35, 51, 53, 59, 61, 65, 67, 71, 73, 77-83 odd
2.2	111	<i>Slope</i>	15, 19, 21-29, 39-43 odd, 51
2.3	122	<i>Equations of a Line</i>	7-21 odd, 29-43 odd, 57, 65-71 odd
2.4	136	<i>Relations and Functions</i>	3, 5-7, 13-41 odd, 43-54, 56-58
2.5	147	<i>Function Notation</i>	9-19 odd, 27, 28, 29, 31, 33, 39, 43, 45, 51, 53, 61-67, 69, 71, 79
2.6	161	<i>Relating Functions to Their Graphs</i>	1-33 odd
2.7	172	<i>Introduction to Graph Sketching: Symmetry</i>	1-11 odd, 17-25 odd
<b>Chapter Three</b>			
3.1	197	<i>Basic Graphing Principles</i>	1, 3, 5, 7, 13-16, 19-22, 25, 26, 29, 33-47 odd,
3.2	207	<i>More Graphing Principles; Types of Functions</i>	1, 7, 9, 15, 16, 19, 22, 27, 45-49
3.3	217	<i>Extracting Functions from “Real Life” Situations</i>	1-3, 5-7, 9-11, 13-15, 17-33 odd, 39, 43
3.4	228	<i>Quadratic Functions</i>	9, 11, 19, 21, 27, 33, 35, 39, 47, 49, 53, 54, 61-69 odd, 76, 79-82
3.5	238	<i>Operations on Functions</i>	3, 9, 17, 19, 21, 23-26, 29, 30, 33, 34, 35, 39-44, 50, 52
3.6	249	<i>Inverse Functions</i>	1, 3, 5, 13-21 odd, 23-27, 29, 37, 41-53 odd, 61, 70

<b>Section</b>	<b>Page</b>	<b>Topic Description</b>	<b>Problem Assignment</b>
<b>Chapter 4</b>			
4.1	273	<i>Polynomial Functions</i>	1-8, 11, 13, 17, 21, 27, 29, 31, 32, 35-43 odd, 40, 42, 44, 61
4.2	283	<i>More Polynomial Functions and Mathematical Models</i>	1, 2, 3, 13, 15, 17-20, 29, 33, 34
4.3	295	<i>Polynomial Division, Roots, Remainder and Factor Theorems</i>	7, 11, 15, 23, 25, 29, 37, 39, 47, 51, 65-79, 83, 84, 85
4.4	305	<i>Roots of Polynomial Equations, Rational Root Theorem</i>	1-13 odd, 41, 43, 47
4.5	320	<i>Rational Functions</i>	1-9 odd, 15, 17, 23, 25, 27, 31, 33, 35, 39, 41, 43, 49-52, 61
4.6	330	<i>Radical Functions</i>	1-4, 8, 9, 13, 17, 21-33 odd, 26, 40, 41, 43, 47-52
<b>Chapters 9 and 10</b>			
9.1	589	<i>Systems of Equations and Inequalities</i>	5, 13, 15, 21, 23, 41, 45-49
10.7	737	<i>Non-Linear Systems of Equations and Inequalities</i>	1, 3, 11, 14, 25-28, 31, 33, 37
<b>Chapter 6</b>			
6.1	415	<i>Angle Measurement and Two Special Triangles</i>	7, 11, 13, 19, 23, 27-43 odd, 47, 49, 51
6.2	428	<i>The Trigonometric Functions of a General Angle</i>	1-55 odd, 56, 57, 59, 65, 67, 73, 74
6.3	441	<i>Right Triangle Trigonometry and Applications</i>	5, 9, 13, 15, 19, 23, 25, 41, 43, 45, 47, 59, 61, 62, 65, 69, 71, 75, 76, 85, 89
6.4	449	<i>The Trigonometric Functions as Functions of Real Numbers</i>	9-53 odd

<b>Section</b>	<b>Page</b>	<b>Topic Description</b>	<b>Problem Assignment</b>
<b>Chapter 7</b>			
7.1	472	<i>The Sine and Cosine Functions and Their Graphs</i>	5-17, 23, 24, 25, 33, 37, 39, 45-48
7.2	480	<i>The Tangent, Secant, Cosecant, and Cotangent Functions and Their Graphs</i>	5, 8 (be familiar with the graphs of the tangent, cotangent, secant and cosecant functions)
7.3	486	<i>Basic Identities</i>	15-63 odd, 67, 69, 71
7.4	493	<i>Trigonometric Equations</i>	1, 3, 5, 13-23 odd, 27-41 odd, 51, 52, 54, 59, 61, 69, 71, 73, 77, 79, 81
7.5	505	<i>The Inverse Trigonometric Functions</i>	1-5, 15-31 odd, 43-53 odd (all of the problems should be done without using a calculator)
<b>Chapter 8</b>			
8.1	515	<i>The Addition Formulas</i>	1, 3, 5, 9, 11, 15, 17, 18, 20-22, 29, 31, 33, 36,
8.2	521	<i>The Double-Angle and Half-Angle Formulas</i>	1, 2, 7, 11, 13, 23, 24, 44, 49
8.3	534	<i>The Law of Sines and the Law of Cosines</i>	1, 3, 5, 9, 15, 18, 27, 40
<b>Chapter 5</b>			
5.1	356	<i>Exponential Functions</i>	1-13 odd, 17-20, 23, 26,27, 28, 33-47 odd, 59, 63, 65
5.2	370	<i>Logarithmic Functions</i>	3, 13, 14, 17, 23, 27, 31, 35, 43-53 odd, 55-59, 63-66
5.3	376	<i>Properties of Logarithms; Logarithmic Equations</i>	1-13 odd, 15-18, 19-31 odd, 32, 33, 35, 37, 38, 39, 41-54
5.4	383	<i>Common and Natural Logs; Change of Base; Exponential Equations</i>	1-11, 15-17, 19, 23, 29-34, 37, 39, 41
5.5	393	<i>Applications</i>	3-13 odd, 14, 15, 33, 34, 37, 39, 43, 44, 51