

Contemporary Math (Math 103: #22864)

Spring 12

Text: *Excursions in Modern Mathematics* (7th ed.), by Peter Tannenbaum (Prentice Hall 2010) ♣ *required*

Class notes: Available at HSU Bookstore. This package contains most class materials (class notes, homework assignments, and copies of old exams) that will be covered. ♣ *required*

Class: 9:00-9:50 M, W FH 118 (Lecture)
9:00-9:50 F (Small Group Session)

Section 11: SH 110 by [Josh Peterson <joshua.peterson@humboldt.edu>](mailto:joshua.peterson@humboldt.edu) 826-4020 @ BSS312
Section 12: SH 109 by [Kim Peterson <kdp19@humboldt.edu>](mailto:kdp19@humboldt.edu) 826-5343 @ BSS312
Section 13: SH 115 by [Katie Harer <kathleen.harer@humboldt.edu>](mailto:kathleen.harer@humboldt.edu) 826-4020 @ BSS312
Section 14: FH 204 by [Benjamin Miltz <benjamin.miltz@humboldt.edu>](mailto:benjamin.miltz@humboldt.edu) 826-5343 @ BSS312
Section 15: WFB 250 by [Drew O'Kane <drew.oKane@humboldt.edu>](mailto:drew.oKane@humboldt.edu) 826-4020 @ BSS312

Professor: Dr. Yoon G. Kim, Department of Mathematics

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<http://users.humboldt.edu/ygkim>

Office hours: 11:00-12:00, MTWF or by appointment. **Check** your leader's office & office hours.

Objectives: This course is designed as part of the general education for relatively nonmathematical students. Emphasis is on quantitative concepts, modern mathematical ideas, mathematical reasoning, and their useful applications to a variety of real world issues.

* This course fulfills [Lower Division General Education Area B: Mathematical Concepts & Quantitative Reasoning](#)

General education in the natural sciences and mathematics focuses on the physical universe and its life forms. This requirement helps students cope with, and participate in, the changing world. Recognizing the importance of scientific methods as investigative tools, the courses present science as a unified discipline with a major impact on the human condition. GE science courses:

- provide an understanding of the nature, scope, and limits of science and its relation to other branches of human inquiry;
- teach the language of science to facilitate cognition, interpretation, and communication;
- develop scientific reasoning for use in the critical examination of information;
- identify sources of information for the pursuit of scientific inquiry;
- impart the facts and principles which form our understanding of the living and nonliving systems of our universe;
- provide direct participation in a laboratory experience;
- develop mathematical concepts and quantitative reasoning and demonstrate their widespread applications in problem solving;
- promote an understanding of the impact of scientific knowledge and technology on our civilization both past and present and recognize the contributions made by men and women; &
- consider the moral and ethical implications of science so as to nurture a respect for human values.

Upon completing this requirement students will be able to:

- use skills beyond the level of intermediate algebra to solve problems through quantitative reasoning
- apply mathematical concepts and quantitative reasoning to problems

Grading:

38 Days of Attendance (Turn in daily attendance slips):	190 points
Homework #1-#13: (15 points per homework) <i>One homework assignment per week.</i>	195 points
Two midterm tests (2/20/12, 4/02/12)	345 points
Final (5/09/12 Wednesday 8-9:50):	270 points

♣ Anyone with over 85% performance will get an “A or A-.” Anyone with less than 45% (out of total) will fail (grade F) this class.
♣ Daily activity puzzle will be distributed at the end of Monday and Wednesday meetings and they are 5 points: 4 points if you get half-right; 3 points if you are wrong. That is, you still get 3 points just by turning in the form with your name.
♣ You will get them back on Fridays. Friday's attendance will also be 5 points.
○ Homework assignments, which are not turned in on time, will receive a grade of zero. Any tests taken at different time will be always <i>more difficult</i> than the regular test.
• (i) Use a <i>pencil</i> (not ballpen) to do your homework or exam. • (ii) Use a clean 8½×11 (letter-size) paper. Do <i>not</i> tear off spiral notes.
○ You are strongly encouraged to attend regularly. If you miss a class you are responsible for finding out what you missed. “ <i>I wasn’t there last time</i> ” is never an acceptable excuse. • In case you have to miss a class, fill out an <i>excuse form</i> (at the end of the notes or create your own in a similar format) and turn it in. • Absence without an <i>excuse form in advance</i> (and your responsibility on that particular day) will receive 0 attendance point. <i>Check with your group leader for more details.</i>

Special Notes

Students with Disabilities: Persons who wish to request disability-related accommodations should contact the Student Disability Resource Center in House 71, 826-4678 (voice) or 826-5392 (TDD). Some accommodations may take up to several weeks to arrange. See <http://www.humboldt.edu/disability/> for additional information.

Add/Drop policy: Students are responsible for knowing the University policy, procedures, and schedule for dropping or adding classes. See <http://www.humboldt.edu/~reg/regulations/schedadjust.html> for additional information.

Emergency evacuation: Please review the evacuation plan for the classroom (posted on the orange signs), and review http://studentaffairs.humboldt.edu/emergencyops/campus_emergency_preparedness.php for information on campus emergency procedures. During an emergency, information can be found on campus conditions at <http://www.humboldt.edu/emergency> or by calling 826-INFO.

Academic honesty: Students are responsible for knowing policy regarding academic honesty. See http://studentaffairs.humboldt.edu/judicial/academic_honesty.php for information.

Attendance and disruptive behavior: Students are responsible for knowing policy regarding attendance and disruptive behavior. See http://studentaffairs.humboldt.edu/judicial/attendance_behavior.php for information.

Class Calendar:

	Monday	Wednesday	Friday
Week 1	MLK Day	1/18/12	1/20/12 A1
Week 2	Class #1 1/23/12 A2	Class #2 1/25/12 A3	1/27/12 A4 HW#1 is due
Week 3	Class #3 1/30/12 A5	Class #4 2/01/12 A6	2/03/12 A7 HW#2 is due
Week 4	Class #5 2/06/12 A8	Class #6 2/08/12 A9	2/10/12 A10 HW#3 is due
Week 5	Class #7 2/13/12 A11	Class #8 2/15/12 A12	2/17/12 A13 HW#4 is due
Week 6	2/20/12 Test #1	Class #9 2/22/12 A14	2/24/12 A15 HW#5 is due
Week 7	Class #10 2/27/12 A16	Class #11 2/29/12 A17	3/02/12 A18 HW#6 is due
Week 8	Class #12 3/05/12 A19	Class #13 3/07/12 A20	3/09/12 A21 HW#7 is due
SPRING BREAK			
Week 9	Class #14 3/19/12 A22	Class #15 3/21/12 A23	3/23/12 A24 HW#8 is due
Week 10	Class #16 3/26/12 A25	Class #17 3/28/12 A26	Cesar Chavez Day
Week 11	4/02/12 Test #2	Class #18 4/04/12 A27	4/06/12 A28 HW#9 & #10 are due
Week 12	Class #19 4/09/12 A29	Class #20 4/11/12 A30	4/13/12 A31 HW#11 is due
Week 13	Class #21 4/16/12 A32	Class #22 4/18/12 A33	4/20/12 A34 HW#12 is due
Week 14	Class #23 4/23/12 A35	Class #24 4/25/12 A36	4/27/12 A37 HW#13 is due
Week 15	Class #25 4/30/12 A38	Review(?) 5/02/12	
		Final 5/09/12 8:00-9:50	

A#: Days Attendance points are collected (5 points per day, total 195 points)

- Each homework set is worth 15 points.

Math103

* Use ***your own blank paper*** and write in a similar format in case you have to miss a class.

- #1. Your attendance points will be taken off *unless* this form is given to your group leader ***in advance*** (or after the fact with a doctor's or someone's ***signed*** note).
- #2. You will get 4 points for turning in this form ahead of your absence or 3 points if turned in after absence (but within 2 weeks after absence).

Section: _____ **Name:** _____

I have to miss Math103 class on _____ because _____

Date: _____

Signature: _____

MATH 103 Syllabus

Chapter 1. The Mathematics of Voting

- 1.1 Preference Ballots and Preference Schedules
- 1.2 The Plurality Method
- 1.3 The Borda Count Method
- 1.4 The Plurality-with-Elimination Method (Instant Runoff Voting)
- 1.5 The Method of Pairwise Comparisons
- 1.6 Rankings

Chapter 2. The Mathematics of Power

- 2.1 An Introduction to Weighted Voting
- 2.2 The Banzhaf Power Index
- 2.3 Applications of the Banzhaf Power Index
- 2.4 The Shapley-Shubik Power Index
- 2.5 Applications of the Shapley-Shubik Power Index

Chapter 3. The Mathematics of Sharing

- 3.1 Fair-Division Games
- 3.2 Two Players: The Divider-Chooser Method
- 3.3 The Lone-Divider Method
- 3.4 The Lone-Chooser Method
- 3.5 The Last-Diminsher Method
- 3.6 The Method of Sealed Bids
- 3.7 The Method of Markers

Chapter 4. The Mathematics of Apportionment

- 4.1 Apportionment Problems
- 4.2 Hamilton's Method and the Quota Rule
- 4.3 The Alabama and Other Paradoxes
- 4.4 Jefferson's Method
- 4.5 Adam's Method
- 4.6 Webster's Method

Chapter 5. The Mathematics of Getting Around

- 5.1 Euler Circuit Problems
- 5.2 What Is a Graph?
- 5.3 Graph Concepts and Terminology
- 5.4 Graph Models
- 5.5 Euler's Theorems
- 5.6 Fleury's Algorithm
- 5.7 Eulerizing Graphs

Chapter 6. The Mathematics of Touring

- 6.1 Hamilton Paths and Hamilton Circuits
- 6.2 Complete Graphs?
- 6.3 Traveling Salesman Problems
- 6.4 Simple Strategies for Solving TSPs
- 6.5 The Brute-Force and Nearest-Neighbor Algorithms
- 6.6 Approximate Algorithms
- 6.7 The Repetitive Nearest-Neighbor Algorithm
- 6.8 The Cheapest-Link Algorithm

Chapter 7. The Mathematics of Networks

- 7.1 Trees
- 7.2 Spanning Trees
- 7.3 Kruskal's Algorithm
- 7.4 The Shortest Network Connecting Three Points
- 7.5 Shortest Networks for Four or More Points

Chapter 9. The Mathematics of Spiral Growth

- 9.1 Fibonacci's Rabbits
- 9.2 Fibonacci Numbers
- 9.3 The Golden Ratio
- 9.4 Gnomons
- 9.5 Spiral Growth in Nature

Chapter 10. The Mathematics of Money

- 10.1 Percentages
- 10.2 Simple Interest
- 10.3 Compound Interest
- 10.4 Geometric Sequences
- 10.5 Deferred Annuities: Planned Savings for the Future
- 10.6 Installment Loans: The Cost of Financing the Present