

**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
LA SIERRA UNIVERSITY**

MATH 202 - CONCEPTS OF MATHEMATICS II (4 UNITS)

REVISED SYLLABUS

SPRING 2007

Instructor Wil Clarke, 256 Price Science Complex, x2548, home phone 687-4556, please don't call after 10:00 p.m.; e-mail: wclarke@lasierra.edu; www: Web page: <http://faculty.lasierra.edu/~wclarke> This webpage contains an expanded version of the syllabus showing how the topics meet the Standards set forth by the California Commission on Teacher Credentialing. I urge you to consult this document.

Texts & Materials

1. Albert B. Bennet, Jr. & L. Ted Nelson *Mathematics for Elementary Teachers*, 7th ed. (2007) McGraw Hill, Boston.
2. A scientific calculator, preferably the TI—Explorer Plus Calculator.
3. The manipulatives: Geoboard and rubber bands, Cuisenaire rods, a pair of dice, pattern blocks.
4. Protractor, compass and straightedge.

Objectives

1. To do and experience mathematics.
2. To create a more positive attitude towards mathematics. This will, of course, not minimize the necessity of hard work in mathematics.
3. To understand the basics of data collection, organization and representation.
4. To understand the basics of the field of probability and how it relates to prediction and gambling.
5. To explore basic concepts of two- and three-dimensional geometry including measurement of area, perimeter and volume.
6. To use the concepts of congruence, and similarity to compare geometrical objects.
7. To find out elementary concepts of transformational geometry and topology.
8. To acquaint the student with both the standard and metric systems of measurement.
9. To use manipulatives as research tools in mathematics.
10. To apply technology in the various fields of mathematics that we study.
11. To evaluate the effect of history on the evolution of mathematics.
12. To examine some issues arising between the Bible and mathematics.

Course requirements

1. *Homework* will be assigned each class period and is due at the beginning of the next class period. Late homework will not be accepted. It is impossible to pass the class without turning in most of the homework. A copy of the assignments and a list of the manipulative sessions will be posted to my webpage periodically.

2. *Tests* and exams determine most of your grade for this class. . Make up tests will not be given. (See the note in the final exam paragraph.) Students who leave the room during a test or exam will not be permitted to return while it is in progress. I sometimes hand out copies of previous tests or exams for your review before an upcoming test. Please note that the actual test may bear no resemblance to the sample handed out.

3. *Final Exam* A score of 50% or more on the final exam is a necessary, but not sufficient, condition to pass the course It will be comprehensive in nature and may cover anything we have studied in class or from the text book. The final exam will be divided into four parts. The first three parts will correspond to the three tests listed below. If you do better on any part of the final exam than you did on the corresponding test, I will give you the higher of the two grades for that test. No work of any kind will be accepted during the week of final exams.

4. *Attendance* is expected and you are responsible for all material presented and assignments made in class. A portion of your grade is based on your participation in class. You are encouraged to ask questions in class. Asking questions can only help your participation grade. Changes in this syllabus become effective after being announced to the class. You are responsible for these, even if you were absent when the changes were announced. The participation grade is mine to give based only on my perception of your

performance. The bulletin states that “students who are absent for as much as 20% of the class should not expect to pass.”

5. *Papers* There will be several papers due throughout the quarter. Papers are due at the beginning of the class period on the date indicated. A paper that is up to one week late will be automatically discounted 33%. Up to 2 weeks 67%. Papers should be typed using a word-processor. They should be free of spelling errors (run a spell-checker on the document before printing) and follow the *MLA* rules of style. Your paper will be severely penalized if it shows evidence of not being proof-read.

6. *Portfolio* You will bring a portfolio of all of the work you have done to the final exam. It should contain all of your homework, completed activity sheets, manipulative session write-ups, papers and handouts (including this syllabus). It should be organized by type of document and date of completion. It will be graded by creative presentation, organization and completeness.

Final examination schedule note from the CAS bulletin “A four-day examination schedule allowing a two-hour period for each class is printed in the *Schedule of Classes*. Students are required to take the scheduled final examinations at the appointed time and place in order to secure credit....Exceptions to the examination schedule are granted only for emergency situations.”

Papers You will have three papers to write. The number of pages for each paper are only approximations, and do not count the title page or the reference pages. Do not use either footnotes or end notes, all notes should be part of the body of the document. All of the papers must have a bibliography/reference and must be word-processed and spell checked and submitted using the *Turn It In* program. (<http://www.turnitin.com>) You can access our *Turn It In* account 1859513 with the password **bennett**. You can remember the password because it is the first author of our textbook. I encourage you to sign on and enter your profile as soon as possible. So that if you have any trouble you won't have to try and solve it in the last moment!

1. Take either of the journals: *Mathematics Teaching in the Middle School*, or *Teaching Children Mathematics* that you feel will be of the most value to you in your career. Give a brief review of twelve articles that you feel form a cross section of the types of articles they publish. These twelve articles should be chosen from as many different issues as possible that were published between January 2006 and April 2007. This paper will probably be anywhere from 5 to 8 pages long.
2. A 2-page reading report on a mathematician of your choice from the Bibliography under the Biographical section. You must have at least one reputable printed source in addition to any Internet sources. See the attached material for suggestions. You should be prepared to present this report orally. Your fellow students will evaluate your presentation. Check with your teacher to make sure that your mathematician is not the same as others are doing in the class. An extensive set of short biographies exists at: <http://www-gap.dcs.st-and.ac.uk/~history/>
3. Technology Paper: The University of Drexel sponsors a math question and answer website: *The Math Forum @ Drexel*. Its URL is <http://mathforum.org/students/>. Find another good free source of enrichment material on the web. **Clear this other site with me before you start writing anything!** Print several topics from each site that you expect will be very useful in your teaching career. Then write a summary paper comparing the two sites. Your paper should include, but not be limited to, a list of topics, including those you printed, that you deem helpful and the reason they appear helpful; describe in which area you would use each topic (for example: adding fractions); a critical comparison of the relative usefulness of the two sites to you; would you recommend that your prospective students access the site? Why? Your summary paper will probably be around 4 pages long (this doesn't count the print outs from both sites).

Grading Scheme

Homework	12%	90—100%	A range
In-Class Tests	44%	80—89%	B range
Final Exam	25%	65—79%	C range
Portfolio	5%	50—64%	D range
Papers	9%	0—49%	F
Participation	5%		

There is no such grade as “C-” in this class.

Disability La Sierra University complies with the Americans with Disabilities Act (ADA) and Section 504 of the

Rehabilitation Act of 1973. Any student with a documented disability (physical, learning, or psychological) needing academic accommodations should contact the Learning Support and Testing Center (LSTC) as early in the quarter as possible. All discussions will remain confidential. Please contact the LSTC (La Sierra Hall, Suite 100 – x2452) for additional information.

Plagiarism and Cheating You are encouraged to seek assistance from faculty or students. However work that is done primarily by someone else is unacceptable and may result in your failing the course. Homework assignments or papers that resemble another student's too closely will be regarded as plagiarism. Plagiarism and/or cheating on tests, exams or papers means an automatic zero on that occasion, a letter to the dean, and possible further disciplinary action.

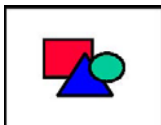
Outline:

DATE			SECTIONS			DATE			SECTIONS		
April	2	M	7.1	May	7	M	CU				
	3	T	7.2		8	T	Test ch 9 & 10				
	4	W	7.3		9	W	History <i>Oral report on Paper 2</i>				
	5	R	M.S. 1		10	R	M.S. 6				
	9	M	CU		14	M	History <i>Oral report on Paper 2</i>				
	10	T	8.1		15	T	History				
	11	W	8.2		16	W	History				
	12	R	M.S. 2		17	R	M.S. 7				
	*	16	M		CU <i>Paper 1 due</i>	21	M	History			
	17	T	Test ch 7 & 8		22	T	History <i>Paper 3 due Initial draft</i>				
	18	W	9.1		23	W	History				
	19	R	M.S. 3		†	24	R	M.S. 8			
	23	M	9.2		28	M	<i>Memorial Day</i>				
	24	T	9.3		29	T	11.1				
25	W	9.4	30	W	11.2 <i>Paper 3 due</i>						
26	R	M.S. 4	31	R	M.S. 9						
30	M	10.1 <i>Paper 2 due</i>	June	4	M	11.3					
May	1	T		10.2	5	T	CU				
2	W	10.3		6	W	Test ch 11 & History					
3	R	M.S. 5		7	R	CU					

CU=Catch Up Day; M.S.=Manipulative Session

Final Exam: Thursday, June 14 at 2:00 p.m.

* Last day to drop a class with no record on transcript. † Last day to drop a class with a "W" grade.



Εἰ δὲ τις ὑμῶν λειπεταὶ σοφίας,
 αἰτεῖτω παρὰ τοῦ δίδοντος Θεοῦ
 πᾶσιν ἁπλῶς καὶ μὴ ονειδίζοντος,
 καὶ δοθησεται αὐτῷ.

If any of you need wisdom, you
 should ask God, and it will be
 given to you. God is generous
 and won't correct you for asking.

James 1:5 (Nestle & CEV)

Bibliography

Biographical

Periodicals

- Albers, Donald “Freeman Dyson: mathematician, physicist, and writer,” *Coll Math J* Jan 94, p3
Albers, Donald J. “A conversation with Robin Wilson,” *Coll Math J* May 90, p178
Albers, Donald J. “An Interview with George B. Dantzig: The Father of Linear Programming” *Coll. Math. J.* September 1986 p293.
Albers, Donald J. “An Interview with Lipman Bers” *Coll. Math. J.* September 1987 p266.
Albers, Donald J. “An Interview with Mary Ellen Rudin” *Coll. Math. J.* March 1988 p115.
Alexanderson, G.L. “A conversation with Saunders MacLane,” *Coll Math J* Jan 89, p3
Alexanderson, G.L. “A conversation with Leon Bankoff,” *Coll Math J* Mar 92, p99.
Crilly, Tony “A Victorian Mathematician,” *Math Gaz* July 95, p259.
Kenschaft, Patricia C. “Charlotte Angas Scott, 1858—1931” *Coll. Math. J.* March 1987 p98.
Reid, Constance “The Autobiography of Julia Robinson” *Coll. Math. J.* January 1986 p3.
Rickey, V. Frederick “Isaac Newton: Man, Myth, and Mathematics” *Coll. Math. J.* November 1987 p362.
Steen, Lynn Arthur “Celebrating Mathematics” *Monthly* May, 1988 p414.

Books (‡Several of these books are on reserve in the library)

- ‡Albers, Donald *Mathematical People* [QA/28/M37/1985] Where most of the articles in *Coll Math J* came from.
‡Bell, E *Men of Mathematics* [QA/28/B4] The classic of mathematics biographies.
Dalton, J *Men and Institutions in American Mathematics* [QA/27/U5/C66/1973]
Fisher, Leonard E. 1982. *Number Art: Thirteen 123s from around the world.* New York. Four Winds Press. [fP 275 F57 1982]
‡Grinstein, Louise *Women of Mathematics* [QA/28/W66/1987]
‡James, Ioan *Remarkable Mathematicians* [QA 28 J36 2002]
‡Osen, Lynn *Women in Mathematics* [QA/28/O83/1974]
Watson-Jones, Kenneth *What game is that?* [QA/43/W37/1987]

Manipulatives

Books

- Balka, Don “Attribute logic block activities” Ideal School Supply (1985) [Curr-I QA19 A87 B34]
Baggett, Patricia *Breaking away from the traditional math book: creative projects for grades K–6* (1995) [Curr-I QA 135.5 B23 1995]
Baratta-Lorton, Mary “Work jobs” Addison-Wesley (1979) [Curr-I QA135.5 B2549 1979]
Bolt, Brian “More math activities” Cambridge U.P. (1985) [QA 95 B65]
Braddon, Kathryn “Math through children’s literature” Teacher’s Ideas Press (1993) [Curr-I QA 135.5 B678 1993]
Bradford, John “Everything’s coming up fractions with cuisenaire rods” Cuisenaire (1981) [Curr-I QA19 C8 B72]
Clarkson, Sandra “100 activities for the hundred number board,” Ideal School Suplly (1985) [Curr-I QA19 H86 C52]
Davidson, Patricia “From here to there with Cuisenaire rods,” Cuisenaire (1981) [Curr-I QA19 C8 D368]
Davidson, Patricia “Idea book for Cuisenaire rods at the primary level,” Cuisenaire (1977) [Curr-I QA19 C8 D37]
Davidson, Patricia “Picture puzzles with cuisenaire rods,” Cuisenaire (19??) [Curr-I QA19 C8 D378]
Davidson, Patricia “Spatial problem solving with Cuisenaire rods,” Cuisenaire (1983) [Curr-I QA19 C8 S6.2]
Degrozia, Joseph “Math is fun” Emerson (1954) [QA95 D36 1954]
Eves, Howard “In math circles quadrants I & II” Prindle Weber Schmidt (1969) [QA99 E83 v.1]
Eves, Howard “In math circles quadrants II & IV squared” Prindle Weber Schmidt (1969) [QA99 E83 v.2]
Eves, Howard “Mathematical circles squared” Prindle Weber Schmidt (1972) [QA99 E842]
Fair, Jan “Tangram Treasury,” Cuisenaire (1987) books 1, 2 & 3 [Curr-I QA20 G35 F347 1987]
Gardner, Martin “Aha Gotcha” Freeman (1975) [QA95 G24]
Gardner, Martin “Aha Insight” Freeman (1978) [QA95 G23]
Jenkins, Lee “Manipulatives” Butterfly Press (1988) [Curr-I QA18 J4 1988]
Martin, George “Polyominoes” MAA (1991) [QA95 M37 1991]
Nelson, Rebecca “Games and activities with base ten blocks,” books 1 & 2 Cuisenaire (1987) [Curr-I QA19 C8 N44]
Johnson, Scott “Some recent discoveries in elementary geometry,” *Math Gaz* Nov 97, p364
Vogt, Sharon *Olympic Math: gold medal activities and projects for grades 4–8* [Curr-I QA 107 V6]

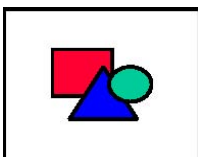
Children's Literature

Books

- Adler, Irving "Mathematics" Doubleday (1990) [Juv QA 40.5 A3 1990]
 Anno, Mitsumaso "Anno's math games" Philomel Books (1988) [Juv QA95 A5613 1987]
 Anno, Mitsumaso "Anno's magic seeds" Philomel Books (1995) [Juv QA295 A6613 1995]
 Anno, Mitsumaso "Anno's mysterious multiplying jar" Philomel Books (1983) [Juv QA246.5 A5613 1983]
 Giganti, Paul "Each orange had 8 slices" Greenwillow (1992) [Juv QA113 G54 1992]
 Jonas, Arthur "Archimedes and his wonderful discoveries" Scott Foresman (1963) [Juv QA 141.3 S45 1985]
 Markle, Sandra "Kids computer capers" Lothrop (1983) [Juv QA76.2 M37 1983]
 Schwartz, David "How much is a million?" Lothrop (1985) [Juv QA141.3 S45 1985]
 Wilkes, Angela "The first book of numbers" Usborne Hayes (1982) [Juv QA113 W55]

Key

- Coll Math J* = The College Mathematics Journal
Int. J. Math Ed = International Journal of Mathematics Education in Science and Technology
J Comp Math = Journal of Computers in Mathematics and Science Teaching
J Research Math Ed = Journal for Research in Mathematics Education
Math Gaz = Mathematical Gazette
Math Mag = Mathematics Magazine
Math Teacher = Mathematics Teacher
Monthly = The American Mathematical Monthly



Hour	Monday	Tuesday	Wednesday	Thursday	Friday
8:00			Committee		
9:00			Committee		
10:00	Coll. Algebra	Coll. Algebra		Coll. Algebra	Coll. Algebra
11:00	Seminar	Assembly		Chapel	Dept Mtg
12:00	Lunch	Lunch	Lunch	Lunch	
1:00	Abstract		Abstract		
2:00	Algebra II	Office	Algebra II	Office	
3:00	Concepts	Concepts	Concepts	Concepts	
4:00	Office		Office		
5:00	CAS mtg or Office	N/A		N/A	