Mathematics 1210-03   Spring 2008

Class Time and Place: M, T, W, F   9:40 – 10:30   JWB 335
Class website   http://www.math.utah.edu/~korevaar/1210spring08

Instructor: Professor Nick Korevaar   581-7318
                                               LCB 204   korevaar@math.utah.edu
            "Office" Hours: MWF 10:45-11:30 in the Math Tutoring Lab (see below).
                                               Th 8:45-9:30 in LCB 204.   Also by appointment.
Teaching Assistant: Sarah Kitchen   581-8338
                                               JWB 307   kitchen@math.utah.edu
            Problem Session: (for Friday quizzes)   Th 9:40-10:30, Room TBA

Texts: <u>Calculus</u> by Varberg, Purcell and Rigdon, Prentice-Hall, 9th edition. ISBN=0-13-230633-6
               <u>Introduction to Polynomial Calculus</u> (referred to as Chapter P). Print this document from the class website

Course Description: Mathematics 1210 is an introduction to differential and integral calculus. Limits, derivatives
        and integrals will be developed as tools to analyze the properties of functions. Application include motion
        and rates of change, optimization and approximation methods, differential equations and the calculation of
        areas, volumes and lengths. Calculus underlies mathematical modeling in all of science and engineering.

Tutoring Lab: T. Benny Rushing Mathematics Student Center (in the basement between JWB and LCB),
                                M - Th   8 a.m. - 8 p.m. F   8 a.m. – 6 p.m.
        The Lab also offers group tutoring sessions. If you're interested, inquire at the Lab.
Private Tutoring: University Tutoring Services, 330 SSB (low cost)   http://www.sa.utah.edu/tutoring/
        There is also a list of tutors at the Math Department office, JWB 233

Grading: Course grades will be calculated as follows:
        WeBWork 20%   Quizzes 10%   Each midterm 20%   Final Exam 30%
Homework: The assignments from the book will not be turned in, but you are responsible for knowing how to do
        the problems. Similar problems will appear on the quizzes and exams, and on your WeBWorK
        assignments (of which there will be approximately 10 during the semester) . You will receive further
        instructions in class on WeBWorK, and you will also find some challenging problems in WeBWork which
        are harder than your exam and book questions. The purpose of homework is to help you learn and work
        with relevant mathematical concepts and their applications, from the mechanical to the advanced level.
        This is because most of you will be using Calculus concepts in later studies, and even in just trying to be an
        informed citizen. I have noticed a trend in recent years where some students get this reasoning backwards:
        they think the purpose of the course is to teach you how to do standard homework problems, perhaps
        because of the current culture that equates competence to standardized test scores. In any case, you will
        want to work hard on both concepts and computations in this class.
Quizzes: There will be quizzes on almost all Fridays that are not exam days. You are allowed to drop two quizzes,
        thus **no makeup quizzes**.
Midterms: There will be three midterms. One will be dropped, but you are advised to take all three. Because one
        is dropped, there will be **no makeup exams**.
Final: The final will be comprehensive and given <u>**only**</u> on the University date listed, in our classroom JWB 335.
Calculators: You are encouraged to use graphing calculators and computer software for visualization, and as
        computational aids on homework, but not as a substitute for learning mathematical concepts. Only
        scientific calculators (i.e. with no graphing or symbolic computation abilities) may be used on quizzes and
        exams, but they are not required. These cost about $10.00, e.g. the TI 30 or the Casio fx-260.

DATES:				EXAMS	
Last day to drop	Wed 1/16			Midterm 1	Fri Feb 1
Martin Luther King Day	Mon 1/21			Midterm 2	Fri Feb 29
Presidents Day	Mon 2/18			Midterm 3	Fri Apr 4
Last day to withdraw	Fri 2/29				
Spring break	March 17-22			**Final**	**Wed Apr 30, 8-10 am**
Class ends	Wed 4/23				

Tentative Schedule. Chapter P is the Polynomial Calculus Notes (Download it from our homepage.)
- We will cover approximately 3 sections per week.
- I will announce the Friday quiz topics in class the preceding Wednesday.
- Do as many of the Practice Problems as it takes, so that you know you could do all of them if necessary.
- Definitely do the VIP (very important problems), even though you won't hand them in.

Week	Topic (approximately by week)	Section	Practice Problems	VIP
Jan 7-11	Slope of a line	P.1	1,2,5,7,9,11,13,15,17,19,20,21,23,25	5,15,17,19,23
	Slope of a curve	P.2	1,2,3,4,6,7,9,10,11,12,13,15	6,10,12,13,15
	Derivative of polynomial	P.3	1,2,3,4,6,7,9,10,12,13,14	3,6,10,13,14
Jan 14-18	Antiderivatives	P.4	1,2,3,4,5,7,8,9,10	4,5,9,10
	Definite Integrals	P.5	1,2,3,4,5,6,7,8	1,5,7,8
	Graphs of equations	0.4	1,2,7,9,15,16,19,31,35,39	1,2,7,16,35,39
	Functions and their graphs	0.5	1,3,13,15,19,21,25,27,29,40	3,13,15,21,25
Jan 22-25	Operations on functions	0.6	1,5,13,15,17,19,23,37	1,13,15,17,23
	Trig functions	0.7	1,2,9,13,15,17,21,25,43,45	1,2,9,17,21,43
	Limits re-introduction	1.1	1-19 odd, 29,31	9,13,29
Jan 28- Feb 1	Limits rigorously	1.2	1-15 odd, 23,27	1,11,15
	Limit theorems	1.3	1-23 odd	3,7,13,19
	Exam 1			
Feb 4-8	Limits with trig functions	1.4	1-15 odd	1,7,13,15
	Continuity	1.6	1-23 odd, 49, 51	1,5,11,17,51
	Derivative reintroduction	2.1	1,2,7,9,13,15,17,21,23,25,27	1,7,17,23,25
	Derivative rigorously	2.2	7,11,13,17,19,21,27,37,41,43	7,13,17,27,41
	Rules for derivatives	2.3	1-39 odd, 14,49,51,55,57,59	14,27,39,49,57
Feb 11-15	Derivatives of Trig Functions	2.4	1-17 odd,18, 23	3,5,7,15,18
	Chain rule	2.5	1-47 odd	3,15,27,43,45
	Higher order derivatives	2.6	1,5,9,11,21,23,25,31,33,39,41	5,11,25,33,39
	Implicit derivatives	2.7	1,3,5,9,13,15,21,27,33,41,47	5,13,15,47
Feb 19-22	Related rates	2.8	1,7,9,11,17,27,29	1,7,9,17,29
	Differentials and approximation	2.9	1,3,5,10,11,17,19,21,24	1,5,11,17,19
Feb 25-29	Maxima and minima	3.1	1,5,8,11,19,21,27,29	1,8,19,21,29
	Monotonicity and concavity	3.2	3,5,9,13,15,21,31,49,51	5,15,21,31,51
	Exam 2			
Mar 3-7	Local extrema, open intervals	3.3	3-29 odd	7,13,19,23,29
	Practical Max/min problems	3.4	3,7,13,15,17,23,27,33	7,15,17,27,33
	Graphing with Calculus	3.5	7,9,17,31,33,43(calculator),53	7,9,17,33
Mar 10-14	Mean Value Theorem	3.6	1-23 odd, 51	1,3,15,19,51
	Numerical solutions	3.7	1-11 odd, 15,35	5,9,15
	Antiderivatives	3.8	5-37 odd	13,15,21,29,35
	Differential Equations	3.9	1,3,5,7,11,17,21,23,25,28,29,35,36	3,5,9,21,25,29
Mar 24-28	Introduction to area	4.1	1-15 odd, 21-29 odd, 54, 55	1,3,7,11,21,23
	Definite integral	4.2	1,3,7,9,11,13,17,19,21,24	1,7,11,17,21
	FTC I	4.3	5-23 odd	5,11,13,19,23
Mar 31- Apr 4	FTC II	4.4	3-23 odd, 35-47 odd, 63	9,17,43,45,63
	MVT for integrals	4.5	1,3, 15-27 odd, 35-43 odd	15,17,37,39,41
	Numerical integration	4.6	1,2,7 (n=4), 19, 20, 27	1,7,19,20,27
	Exam 3			
Apr 7-11	Area of plane regions	5.1	5-25 odd	5,7,13,21,25
	Volumes by planar slabs	5.2	1-27 odd	7,15,21,23,27
	Volumes by cylindrical shells	5.3	1-21 odd	5,11,13,15,19
Apr 14-18	Length of plane curves	5.4	7-11 odd, 21-31 odd	7,9,11,23,29
	Work and fluid force	5.5	1-29 odd	3,5,7,9
	Moments and centers of mass	5.6	1-29 odd	1,3,5,9,21,25
Apr 21-23	Probability and random variables	5.7	1-27 odd	5,9,17,25