

Calculus with Review I

MATH 125-03
CRN 81207
Fall 2008

Professor: Todd Swanson

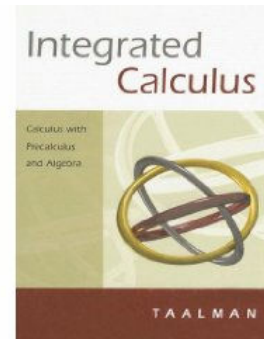
Class time/Location: 9:30 - 10:20, MWF: AW B01
Tuesday VWF 102

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Text: *Integrated Calculus* by Laura Taalman



Office Hours: I have scheduled office hours 1:00-1:50 p.m. on Monday, Wednesday, and Friday, 11:00-11:50 a.m. on Tuesday, and 9:30-10:20 a.m. on Thursday. However, when I am in my office, my door is always open and you are welcomed to come see me. You can check my class schedule at ww.math.hope.edu/swanson/schedule.html.



Calculator: The graphical representation of a function is very important and will be used extensively in this course. Because of this, a graphing calculator is required. I will be using the TI-84 in class.

Available Help: You are encouraged to use the help that is available to you for this class. This includes your classmates, your professor, and the Mathematics Walk-in Center.

- **Your Classmates:** When John Donne wrote, "*No Man is an island, entire of itself...*" he was trying to make the point that we do not live in isolation and that the success of a person is dependent on others. While Donne was not talking specifically about learning mathematics, the idea is the same. We all can benefit greatly from the help of others *and* from helping others. I recommend that you team up with at least one other person in the class and form a study group. I would encourage the members of each group to help each other when doing homework, preparing for tests, or anything else related to success in learning calculus. I would hope the members of your group are the first that you would call on if you were having difficulty. If, for whatever reason, your group is having difficulty with a problem, do not hesitate to use one of the other resources below.
- **Your Professor:** Feel free to email me with any questions you have. When I am in my office, my door is always open and you are welcomed to come see me. My office hours are listed above.
- **Mathematics Lab:** Besides seeking help from your classmates or your professor, help for this course is available at the Mathematics Lab. The center staffed by Hope students and is scheduled to be open from 7:30-9:30 p.m., Sunday through Thursday in VZN 274. There are tutors available there to help you figure things out rather than do the problems for you.

Curriculum: This course covers the material typically taught in the first half of a Calculus I (Math 131) course. The calculus material is supplemented by reviewing topics of high school mathematics. Specific topics can be seen on the attached schedule. Emphasis in this course is placed on understanding the concepts of calculus, not on rote memorization of algorithms. Taking the second semester, MATH 126, is *highly* recommended to complete the Calculus I curriculum.

Exercises: Learning mathematics requires practice. Just as you cannot drive a golf ball 300 yards straight down the fairway by simply watching Tiger Woods, you also cannot learn mathematics just by watching somebody work problems. Completing the daily assignments in a timely manner is extremely important.

Assignments and Quizzes: There will be a number of hand-in assignments given throughout the semester. These will all be graded and returned to you. They may consist of exercises from the text or something more in depth. Quizzes will be short in length and are noted on the schedule. No late quizzes will be given without prior permission.

Colloquium Requirement: The mathematics department hosts several colloquia throughout the semester, usually on Thursdays at 4:00 p.m. These are designed to give you a taste of what people are doing in mathematics research and other mathematical applications beyond what we see in our textbook. All students enrolled in 100-level mathematics courses need to amass **two colloquia credits** over the course of the semester. One colloquium credit is awarded after attending a colloquium and sending me a two-paragraph email with a brief summary of what you learned and what you thought of the presentation.

As an alternative to attending the colloquia you may solve the “Problem of the Fortnight” for a colloquium credit. The due dates for the Problem of the Fortnight are published with the problem in the *Off on a Tangent* e-newsletter every two weeks.

For each part of the colloquium requirement that you do not complete, your grade will be lowered by 1/3 of a letter grade (ex: B+ to a B).

Grading: A point distribution is as follows:

- Hour Tests (3) - 300 points
- Final (Comprehensive) - 200 points
- Quizzes and Assignments - ≈150 points

The tests will be given on the following dates:

- Test 1 – Friday, September 26
- Test 2 – Friday, October 17
- Test 3 – Monday, November 10
- Final Exam - 2:00 p.m. Wednesday, December 10



Each graded piece of work will be assigned a specific number of points. The final grade will be determined simply by your percentage of the total points accumulated during the semester. I will tentatively use the following scale. This may be adjusted sometime during the semester. If it is, I will let you know.

0-59%=F; 60-62%=D-; 63-66%=D; 67-69%=D+; 70-72%=C-; 73-76%=C; 77-79%=C+;
80-82%=B-; 83-86%=B; 87-89%=B+; 90-92%=A-; 93-100%=A.

Attendance: You are expected to attend every scheduled class. Attentiveness, constructive participation in class discussion, and asking relevant questions will certainly improve your comprehension of the material. If you do miss class you are responsible for getting the notes or any assignment changes from a classmate.

Academic Integrity: Although working with others on homework assignments is fine, each student should submit his/her own solutions. Copying another student's work, particularly on quizzes/tests, and claiming it as your own, constitutes plagiarism and will be reported to the provost. Please see <http://www.hope.edu/lib/plagiarism/penalties.html> for more information.

Schedule and Assigned Problems (changes may be announced in class)

Day	Date	Section	Topic/Assignment
Tue	8/26	0.1	Numbers and Sets 3, 5, 7, 8, 12, 14, 17, 21, 22, 26, 33, 36, 42, 48, 51, 56, 57, 60, 62, 65, 66, 67, 70, 74, 80, 83, 89, 92, 96, Problem 0 for next section
Wed	8/27	0.2a	Equations and Factoring 11, 12, 16-19, 23-25, 28, 29, 32, 33, 35-37, 39, 43, 46, 49, 54, 55, 56, 61
Fri	8/29	0.2b	Fractions and Systems of Equations 14, 20-22, 62, 64, 67, 69, 72, 75, 78, 83, 86, Problem 0 for next section
Mon	9/01	0.3	Inequalities 1, 2, 5, 7, 9, 13, 14, 17-20, 23, 24, 25, 32, 33, 38-44 all, 48, 50, 51, 53, 57, 59, 60, 63, 66, 68, 69, 73, 77, 78, 81, Problem 0 for next section
Tue	9/02	0.4	Logic 1, 4, 6, 7, 12-17, 20, 22-24, 27, 31, 34, 43, 46, 51, 56, 57, 64, 71, 76, 80, 81
Wed	9/03	0.5a	Direct Proofs 2, 19, 20, 25, 32
Fri	9/05	0.5b	Quiz 1 (0.1-0.5a) Proof by Contradiction and Proofs Involving Inequalities 3, 21, 22, 35, 38, 39, 42, Problem 0 for next section
Mon	9/08	1.1	What Is a Function? 1-6, 11, 13, 15, 16, 20, 22, 24, 27, 28, 32-35, Problem 0 for next section
Tue	9/09	1.2	Graphs of Functions 5, 7-15, 22, 23-26, 31, 32, 35, 37-39, Problem 0 for next section
Wed	9/10	1.3a	Linear Functions 1-3, 9-11, 13, 15, 18-23, 44, 45, 47
Fri	9/12	1.3b	Quiz 2 (0.5b-1.3a) Proportional Functions, Equations for Lines, Parallel and Perpendicular Lines 5, 7, 27-33, 35, 38, 40, 42, Problem 0 for next section

Mon	9/15	1.4	A Basic Library of Functions 2, 8-13, 15-17, 19-22, 25, 27, 29, 30, 32, 34, 36, 38, 40, 44, 46, 48, 51, Problem 0 for next section
Tue	9/16	1.5a	Combinations and Compositions of Functions 3, 5, 7, 11, 14, 15, 29-32, 37, 43, 47, 51, 52, 54, 59, 62, 66, 71, 75, 82, 90
Wed	9/17	1.5b	Decomposing Functions 38, 39, 41, 98-103, Problem 0 for next section
Fri	9/19		Quiz 3 (1.3b – 1.5)
		1.6a	Transformations 1-4, 36-44
Mon	9/22	1.6b	Multiple Transformations and Symmetry 5-7, 18-31, 33, 45-50, 69, 71, 73, Problem 0 for next section
Tue	9/23	1.7	One-to-One Fns, Inverse Functions 3, 6-12, 15, 17, 23, 27, 29, 31, 33, 36, 37, 42, 43, 46
Wed	9/24	Review	
Fri	9/26		Test 1 (chapters 0 and 1)
Mon	9/29	2.1	Intuitive Notion of Limit 1-19, Problem 0 for next section
Tue	9/30	2.2	Formal Definition of Limit 1, 2, 3, 6-9, 11, 13-20, 24, 25, 26, 27-32, 40, 42, 44, 56, 58 Problem 0 for next section
(No class on Wednesday 10/01 for the Critical Issues Symposium)			
Fri	10/03	2.3	Delta-Epsilon Proofs 1-3, 5, 7, 11, 24, 13, 26, 15, 28, 18, 35, 37, Problem 0 for next section
Mon	10/06	2.4	Limit Rules 3-12, 32-51, Problem 0 for next section
Tue	10/07	2.5	Calculating Limits 1-16, 17-45 odd, 46, Problem 0 for next section
Wed	10/08	2.6	Continuity 2, 4-17, 18-23, 27-33, 35-37, 41-55 odd, 57-60, Problem 0 for next section
Fri	10/10	2.7	Quiz 4 (2.1-2.6) Two Theorems about Continuous Functions 1-6, 19-41 odd, 47-53 odd

Fall Break!

Wed	10/15	Review	
Fri	10/17	Test 2 (Chapter 2)	
Mon	10/20	3.1	Tangent Lines and the Derivative at a Point 3, 5, 6, 8, 9, 11, 12, 23, 24, 29, 34, 35, 37, 41-61 odd, 69, 70, 77, 81, 83, Problem 0 for next section
Tue	10/21	3.2	The Derivative as an Instantaneous Rate of Change 2-4, 6, 8-11, 16, 21, 23, 25, 27, 30, 31, 34, Problem 0 for next section
Wed	10/22	3.3	Differentiability 1, 2, 5, 8-16, 20-21, 26, 27, 37, Problem 0 for next section
Fri	10/24		Quiz 5 (3.1-3.3)
		3.4a	The Derivative as a Function, day 1 1-11, 20, 21, 23-41 odd, 49, 51, 53, 57, 59, 61
Mon	10/27	3.4b	The Derivative as a Function, day 2 12-16, 55, 63, 65, 67, 68, 69, Problem 0 for next section
Tue	10/28	3.5	Basic Differentiation Rules 1-8, 16-19, 22-28, 31-43 odd, 48-54, 55-65 odd, 68, 71, 77, 79, Problem 0 for next section
Wed	10/29	3.6a	Three Theorems about Tangent Lines, day 1 1, 3, 4, 6, 9, 10, 12-14, 16-22, 33-35, 37, 40, 42, 44, 45-51 odd, 64 (do for local minimum).
Fri	10/31		Quiz 6 (3.5-3.6a)
		3.6b	...day 2: The Mean Value Theorem 5, 7, 8, 11, 15, 24-26, 52-55, 57, 59, 60, 63, 66, Problem 0 for the next section
Mon	11/03	3.7	The First Derivative and Function Behavior 1-8, 10-15, 19, 20, 22-27, 28-46 even, Problem 0
Tue	11/04	3.8a	The Second Derivative and Function Behavior, day 1 1, 2, 5-16, 21, 24, 25, 26-42 even, 63, 65, 73
Wed	11/05	3.8b	The Second Derivative and Function Behavior, day 2 17-19, 44-48 even, 52, 56, 61, 67, 68, 71
Fri	11/07	Review	
Mon	11/10	Test 3 (Chapter 3)	
Tue	11/11	4.1a	The Algebra of Power Functions 12, 13, 17-31 odd, 53-61 odd, 69-75 odd
Wed	11/12	4.1b	Extraneous Solutions and Power Functions 1-9 odd, 33-51 odd, 77-83 odd, Problem 0 from next section

Fri	11/14	4.2	Limits of Power Functions 9, 11, 13, 23-39 odd, 47-59 odd, Problem 0 from next section
Mon	11/17	4.3	Derivatives of Power Functions 4, 6, 9, 10, 12, 14, 28-33, 35-43 odd, 51, 54, 55, 59, 67, 69, 71, 74, Problem 0 from next section
Tue	11/18	4.4	Graphs of Power Functions with Integer Powers 5-11, 13, 14, 18, 19, 24, 33, 36, 37, 40, Problem 0 from next section
Wed	11/19	4.5	Quiz 7 (4.1-4.4a) Graphs of Power Functions with Rational Powers 5-10, 13-15, 18-23, 42-50
Fri	11/21	5.1	The Algebra of Polynomial Functions 1-9 odd, 22, 24, 27-37 odd, 42, 43, 48-51, 54, 55, 61, 65, 69, 71, 75, 77, 81, 83, 93, 95, Problem 0 from next section
Mon	11/24	5.2	Limits & Derivatives of Polynomial Functions 2-14, 15, 17, 19-26, 27-55 odd, 58, 61, Problem 0 from next section
Tue	11/25	5.3	Graphing Polynomial Functions 3, 4, 5, 6-12 even, 14-20, 21-29 odd, 32, 36, 38, 41, 44, 48, 49-53 odd, Problem 0 from next section
Wed	11/26	5.4a	Optimization with Polynomial Functions – Day 1 3-7, 10, 12, 14, 16, 19, 20

Happy Thanksgiving!

Mon	12/01	5.4b	Optimization with Polynomial Functions – Day 2 21-27, 29, 31, 38
Tue	12/02		Quiz 8 (4.5-5.4) Review chapters 4-5
Wed	12/03		Review chapters 0-3
Fri	12/05		Practice Test