Math 109
Fall Semester, 2008
Evelyn C. Bailey, Pierce 122

Text: Graphs and Their Uses by Oystein Ore and revised by Robin J. Wilson

Reader: Infinity by Lillian R. Lieber

Goals: This course is an introduction to graphs and the field of graph theory. Student outcomes and opportunities:

The student should be able: (Cognitive)

(1) to identify several types of planar graphs; determine when a graph is planar;
(2) to work several standard problems related to graph theory;
(3) to discuss several well-known problems and theorems in graph theory;
(4) to know several mathematicians and their contributions to graph theory;
(5) to develop some problem solving skills needed to find patterns;
(6) to begin to understand the role of proof in mathematics;
(7) to know about some big numbers; begin to gain an understanding about infinity.

The student will have the opportunity: (Affective)

(1) to work several non-standard problems in graph theory and in related fields; (2) to prepare a class project that explains "How big is BIG?";
(3) to work in smaller groups on two construction projects related to graph theory;
(4) to involve the class in a group presentation on a topic related to graph theory.

Grading:		
3 tests @ 100		300
Notebook checks, homework problems@ 50		150
Class Project, contribution	100	
Constructions @25	50	
Group Presentation	100	
Individual response papers @ 20	100	
TOTAL		800

The number of points the student accumulates throughout the semester determines student grades in this course.

In general,

A, A-	720 points and up
B+, B, B-	640 - 719 points
C+, C, C-	560 - 639 points
D+, D	500 - 559 points
F	below 500 points

Note: There will be no final exam.

Each student has the following responsibilities:

1. Come prepared and on time to every class.
2. Complete all work on time with proper thought.
3. Consider that it is not always the fault of the instructor if the student doesn't understand the material
4. Treat the instructor and peers with respect.
5. Ask questions. Asking questions is a sign of maturity, not ignorance.
6. Understand that the instructor is not trying to "nit-pick" when grading and remember that grading is the responsibility of the instructor.

The instructor has the following responsibilities:

1. Come prepared to every class.
2. Design each so students can accomplish the cognitive objectives listed in the syllabus.
3. Provide appropriate tips for studying and study materials as seem appropriate.
4. Create a mutually respectful classroom environment.
5. Return tests in a timely manner so that students will know their grades.
6. Grading, as far as possible, to be consistent and impersonal even though students might not agree with the decisions concerning partial credit.

Some Policies:

Tests: It is the responsibility of the student to notify your instructor before the scheduled test if there is a conflict. If your conflict is legitimate, provisions will be made for you to take the test prior to the scheduled time. Emergencies will be handled on an individual basis. If special provisions are needed, it is the responsibility of the student to notify your instructor well in advance of the needed provision.

Attendance: Each student is responsible for work missed because of absences. There is no policy on class attendance; however, it is to the student's advantage to be in class and class attendance will be taken. Regular attendance will be taken into account for students who have total points on the borderline between two grades. If you are absent while the class is working on the class project, then 10 points per class will be deducted from your contribution on this project. Emergencies will be handled on an individual basis.

Outside help: There are no tutors for this course; however, students may come by during office hours and ask questions and/or work in the Math Center, outside the instructor's office.

ALL STUDENTS HAVE AGREED TO ABIDE BY THE HONOR CODE. ALL WORK SUBMITTED FOR CREDIT IS ASUMED TO BE THE WORK OF THE STUDENT.

Tests:

Tests are given during class time on the day designated in the attached daily schedule. Test dates are: **September 23**, **October 23**, and **November 25**. There is no final exam. If a student has a conflict that is considered legitimate by your instructor, then the student may take the test before the scheduled time. There are no make-up tests after the scheduled test. Emergencies will be handled on an individual basis. For any missed test, the student needs appropriate verification paperwork for the absence.

Homework:

Homework assignments are made at the end of class and put on the class conference, after each class. Students are to complete homework in a spiral notebook, dates and problem numbers clearly labeled.

The homework notebook is to be turned in on the day of the test, for each test. The grade for each individual will be determined by checking a random selection of five problems from those assigned. For each problem selected: ten points are given to totally correct work, seven points are given for attempted work, and zero points are given for no work.

Class Project:

Each student will be involved in the class project and each student is expected to contribute to the result, a power point presentation to answer, "How big is big, and beyond?"

The class will elect a chairperson and secretary. The chairperson will conduct business toward the completion of the project at the end of most classes and pace the completion of parts of the project throughout the semester so that it is completed in a timely manner. The secretary will keep notes of what happens and what is decided and posts these notes on the class conference. The class project will be viewed in class on **December 2.**

At the completion of the class project, each student will provide a comprehensive listing of his/her individual contributions, including the date accomplished. This individual contribution sheet, the completed power point presentation, comments/work in progress provided on the class conference, and the secretary's log account of the project's progress will determine grades. The individual contribution sheet is due on **December 2**.

Constructions:

Each student, individually, will complete the construction projects. These constructions will begin in class and be completed outside of class, due one week after beginning. Each student needs to have a concrete model(s) as the result of this project. Individual grades are determined by the quality of the construction and the responses to included questions. See the attached listing of topics for dates.

Response papers:

There will be five response papers, due throughout the semester. The questions are on the attached list of topics. These are related to either what we are doing in class, the readings, or the class project. These papers should be well-written, reflective and substantive, two pages, double spaced, Times Roman type, 12 font. If you use references, these need to be

noted. If the quality of the paper is inadequate, they will be returned and the student will have an opportunity to re-write the paper for half credit.

Group Presentations:

There will be five presentations, paced throughout the semester. In groups of four, students will prepare a short (10-15 minutes) presentation after which the group will have some type of demonstration that will involve the class in an activity related to the presentation. Total time for the group presentation is between 30 and 35 minutes or half the class period. On the day of the presentation, each member of the group presenting needs to turn in a clearly stated detailed list of the contributions made to the presentation.

Class members should learn something important about each of the topics below plus each class member needs to participate in a related activity, designed by the group presenting, such as working a problem, constructing something, coloring or drawing something, measuring or comparing things, or writing something. Each class member not involved in the specific presentation needs to prepare a critique of the presentation, from three to four paragraphs (150 to 200 words). These critiques are due the class period following the presentation.

Students are responsible for the content from these classes so the group might choose to have notes available and/or posted on the class conference. The group presenting may request that the class students bring supplies on these days, such as scissors, crayons, etc.

Topics are assigned on a first come basis. Your instructor will work with each group as needed during the planning stages. It is advisable to send a summary via e-mail or make an appointment to come by the office at least one week prior to the presentation.

Topics and dates for these presentations are:

9/25 The importance of zero, π , e, i (summary by 9/18)

9/25 Dimensions (one, two, three, and more) (summary by 9/18)

10/16 Zeno and the concept of paradox (summary by 10/7)

10/16 G. Cantor and the arithmetic of infinity (summary by 10/7)

11/18 Four Color Problem (summary by 11/11)

Topics by days:

8/28, 9/2	Introduction, "What is a graph?" Discuss class project	text sections 1.1 - 1.3
9/4	Planar Graphs - Introduction	text sections 1.4 - 1.6

9/9 Interval Graphs, Jordan Curve Theorem, text section 1.7
Sprouts, Bridge Problem
Elect chairperson and secretary, discuss class project

9/11 Connected graphs, Hamiltonian Cycles, text sections 2.1 - 2.4, 2.5
Article on Graph Theory
Response paper 1: "How big is BIG?" due 9/18

9/16 Ferryman problems, Garbage Truck problems,
Review for test

9/18 Flatland
Response paper 2: How is the culture in Flatland like our culture and how is it different?, due 9/25
Response paper 1 due

9/23 **Test 1**
Notebook due

9/25 Presentations: (1) The importance of zero, π , e, i
(2) Dimensions (one, two, three, and more)
Response paper 2 due

9/30 Trees text sections 3.1 - 3.2
Discuss class project

10/2 Alkanes, economy tree, shortest route text 3.3
Begin construction project 1, due 10/9

10/7, 10/9 Directed graphs, Tournaments, phone calls text - parts of chapter 5
Construction project due on 10/9

10/14 Fall break

10/16 Presentations:(3) Zeno and the concept of paradox
(4) G. Cantor and the arithmetic of infinity

10/21 Review for test
Discuss class project
Response paper 3: How might you experience 'the infinite' and infinity in your everyday life?, due 10/28

10/23 **Test 2**
Notebook due

10/28	Donald in Mathemagic Land Response paper 3 due Response paper 4: What are the Fibonacci numbers and how are they related to the Golden Ratio and what Donald experienced?, due 11/4	
10/30	Games and puzzles, pouring problems, NIM, "-aminos"	text - parts of chapter 6
11/4, 11/6	Proof, Induction proof Response paper 4 due on 11/4	Article on proof; handouts
11/11	Planar Graphs, Euler's Formula Spanning Trees	text - parts of chapter 8
11/13	More about proofs Response paper 5: What is proof and why is it important in mathematics?, due 11/20	
11/18	Presentation: (5) Four Color Problem Begin construction project 2, due	text - parts of chapter 9
11/20	Review for test 3 Response paper 5 due	
11/25	**Test 3** Notebook due	
11/27	Thanksgiving	
12/2	**Class Project complete**, watch final version **Contribution sheet** for class project due Construction project 2 due	
12/4	**Course Evaluations** **Receive your total points, grade in course.**	

Mathematics 111, Calculus I
Fall, 2008 - Dr. Evelyn C. Bailey

Textbook: Calculus: Early Transcendental Functions, 4th Edition by Larson, Hostetler and Edwards; Houghton Mifflin Company.

Course Content:

Mathematics 111 is the first semester of introductory calculus. Course content includes limits; continuity; the derivative; differentiation of algebraic, trigonometric, and the natural logarithmic and exponential functions; applications of derivatives; anti-derivatives; the definite integral; simple integration by substitution; and applications of the definite integral. A list of specific topics by day is attached.

Mathematics 111 is a beginning course. No prior exposure to calculus is needed! A good solid background in pre-calculus (algebra, logarithms and exponents, and trigonometry) is extremely important.

Goals:

By the completion of this course, the student should be able to:

(1) Evaluate limits and interpret the results in relation to the graph of a function;
(2) Define the derivative and relate this definition to the graph of a function and to the concept of "rate of change;"
(3) Give proofs of the rules of differentiation.
(4) Differentiate algebraic, trigonometric, logarithmic and exponential functions.
(5) Apply the derivative to the graphs of functions, to optimization situations and to related rate problems.
(6) Define the definite integral and its relationship to area and to volume.
(7) Evaluate definite and indefinite integrals using algebra techniques and u-substitution.

In general, each student should be able to calculate derivatives, to evaluate limits and to evaluate integrals (both definite and indefinite). Students should be able to apply appropriately their calculations and evaluations. In addition, students should understand the concepts of limit, continuity, derivative, anti-derivative, and have a beginning understanding of proof. The primary purpose of this course is to provide a solid foundation for success in Mathematics 112 since both Mathematics 111 and 112 provide the student with a year of college calculus.

Class Attendance:

The student is responsible for the course material discussed in class; therefore the student is expected to attend all classes. Students who attend class on a regular basis have higher averages than those who elect to be absent occasionally. An inordinate number of absences will be handled in accordance with the College's policies and reported to the appropriate academic personnel.

Calculators: Calculators will not be needed or allowed on tests or quizzes.

Responsibilities:

Students

As far as this course, each student needs to attend class regularly, to actively participate in the learning process both during class and outside of class, and to use the available support services in order to reach the expected competence level required in this course.

* Each **student** has the following responsibilities:

1. Come prepared and on time to every class.
2. Complete all work on time with proper thought.
3. Consider that it is not always the fault of the instructor if the student doesn't understand the material. Use your outside help (office hours, SI sessions, e-Reserves)
4. Treat the instructor and peers with respect.
5. Ask questions. Asking questions is a sign of maturity, not ignorance, as long as the student thinks clearly before asking.
6. Understand that the instructor is not trying to "nit pick" when grading and remember that grading is the responsibility of the instructor. Accuracy is important in this class!

Instructor

As far as this course, the instructor is a facilitator of student learning and as such, should provide materials and the environment to enable students to learn what is expected.

* The **instructor** has the following responsibilities:

1. Come prepared to every class.
2. Design each class so students can accomplish the cognitive objectives listed in the syllabus.
3. Provide appropriate tips for studying and study materials as seem appropriate.
4. Create a mutually respectful classroom environment.
5. Return tests and quizzes in a timely manner so that students will know their grade.
6. Grading, as far as possible, to be consistent and impersonal even though students might not agree with the decisions concerning partial credit.

Grading:

The student's final course grade will be determined as follows:

Major tests (4 @ 100 points)	400 points
Quizzes (8 out of 10, as noted above)	200 points
Graphing Portfolio	150 points
Gateway Test	50 points
TOTAL	800 points

In general, letter grades will be determined as follows, based on points each student earns:

A: 720 or more points
B: 640-719 points
C: 560-639 points
D: 480-559 points
F: fewer than 480 points

Grades of A-, B+, B-, C+, C-, D+ may be assigned for sums of points near the above cut-off totals. For example, a B+ could be assigned for a sum of 888 points. Ultimately, the assignment of plus and minus is dependent on the overall class distribution of sums of points.

Homework:

Homework assignments are for the student's benefit and will not be collected. It is important, however, that each student thoughtfully completes most of the problems assigned. **The student will need to spend at least 10 good hours of study each week, not counting time spent taking quizzes, reviewing for tests, and preparing the graphing portfolio.**

Students should keep current. Cramming for calculus tests will not result in the best grade or the needed retention of material. This course builds on previous work. Students should get at least 6 hours of good rest prior to taking a calculus test; otherwise the law of diminishing returns kicks in, students will lose more than they retain.

Students taking this course need to schedule study time throughout the week to total a minimum of ten hours for this course alone. Marathon studying does not work in calculus. Students who have had some calculus previously sometimes fail to study appropriately.

Gateway Exam:

In order to pass this course, the student must pass an examination on derivatives. All 50 points will be given for a perfect paper on the Gateway Exam. There will be four opportunities for the student to earn all 50 points. If the student has only ONE mistake, the student may choose to keep a score of 35 points and not retest. More than ONE mistake is not considered a passing grade. Students making at least 35 on Gateway Exam 1 will receive a bonus of 20 points; students making at least 35 on Gateway Exam 2 will receive a bonus of 10 points. Each student needs to take each scheduled gateway exam until the student passes. Students may re-test for a better score with no penalty. Passing the Gateway Exam is a requirement for passing this course (Goal 4).

An example Gateway Exam will be provided prior to the first testing day. The Gateway Exams will be given on the following mornings in Seney 209 and 215: Thursday, **September 25**; Thursday, **October 9**; Tuesday, **October 28**; Tuesday, **November 18**. Any student not passing one of the scheduled Gateway Exams and who attempted all four exams may petition the instructor to take a fifth Gateway Exam.

Quizzes:

All quizzes are announced and "take home." A student must be present in class to receive a quiz. Students must complete quizzes during one sitting and use only authorized materials (pencil, paper, and any reference material specifically authorized for a given quiz). Quizzes are due at class time on the class day following their assignment. If the student is not in class when a quiz is given out, then that student generally cannot receive a copy of the quiz; however, exceptions to this policy are sometimes permitted on an emergency basis.

Each quiz will be graded on a basis of 25 points although some quizzes may contain bonus points. Ten quizzes will be given and the best eight will be used as part of the grade determination for this course. The attached daily topics schedule provides the schedule for quizzes.

Major Tests:

Four tests will be given as follows at 2:15 in Seney 209 and 215: Test 1 on Friday, **September 19**; Test 2 on Friday, **October 17**; Test 3 on Friday, **November 14;** Test 4 on Friday, **December 5**. The final exam schedule lists the date and time for the final.

Students are expected to take tests at the scheduled times. Conflicts, problems and emergencies will be handled on an individual basis. For reasons deemed legitimate by your professor, arrangements may be made for a student to take a test prior to the testing time. Any student who needs special accommodations must provide documentation several days in advance of the needed accommodation so that appropriate arrangements may be made.

Graphing Portfolio:

The student will use software (GRAPHMATICA) available in the computer lab to prepare a portfolio of computer-generated graphs. The portfolio is to contain at least 9 distinctly different displays of graphs. Each function is to be clearly identified by the formula. You should use only algebraic, trigonometric (including inverse trigonometric), logarithmic, exponential functions or combinations of them to construct your graphs (no polar).

Technical Graphs: The student must have at least three graphical displays where the important features of the graphs are clearly labeled (maximum, minimum, inflection points, etc.) The Curve Sketching Checklist (provided during the graphing section of this course and on e-Reserves) should be used to determine what graphing aspects should be labeled. These aspects need to be marked but need not have ordered pairs, real or approximated. These are the **technical graphs**.

Thematic Graphs: The remaining graphs, at least six graphical displays, should be linked by a theme and should combine several functions to make picture displays. These are the **thematic graphs**.

Students may receive help with the use of the computer and software, but students must choose their own functions and create their own printouts and portfolio.

Evaluation of the portfolio will be made on: (1) the selection of graphs, (2) the documentation associated with the graphs, (3) the completeness of the technical graphs, (4) the creativity of the thematic graphs and (4) expectation based on previous students' work. In addition, accuracy, clarity, organization and originality are important in the finished product.

In the past, students have indicated that 40 to 60 hours are needed to complete this project; therefore each student should plan ahead. This assignment is due on Monday, **November 24** at class time. Each student will "show and tell" about his/her portfolio on Monday, November 24.

Support Services:

Students are encouraged to use the following:

Office hours will be posted weekly on the class conference. Students should use this time to come by and ask specific questions related to this course. In addition, students may e-mail, either privately or on the class conference.

There is a class conference, Math 111 Fall 2008. Students should have the class conference on their desktops and should consult this conference frequently for announcements about office hours, SI sessions, tutoring, outlines for tests, posting of grade distributions, etc. Students may pose individual questions on the class conference.

There are SI leaders for Math 111. Our SI student leaders will schedule review sessions each week, the topic for which will be posted on the class conference. Each student is encouraged to pick at least one of the times per week and attend regularly. Even though these sessions are optional, students who attend SI sessions generally do better in the courses for which there are SI leaders.

Student tutors are available (schedule to be posted as soon as it is finalized). Study groups organized by students are highly recommended. The meetings should be scheduled weekly and should be part of a regular weekly routine.

E-Reserves are available through the library. Each student needs to have these handouts prior to when they will be needed for the class. These handouts provide additional problems and explanations to the material being studied.

Written Style/Neatness:

Neatness is one way of showing pride in individual work and courtesy toward the instructor. Remember that thoughts in mathematics are expressed in sentences, such as "1 + 1 = 2." There is a subject "1 + 1", a verb "=", and a predicate "2". Note that "=" should not be treated as a comma ",". When using an equality symbol, make sure that both sides of the equation are equivalent. For all work, each student should strive to make a neat and logical presentation while using mathematical symbols appropriately. Students taking time to be neat while working mathematical problems has been shown to eliminate many careless mistakes so that students can focus on conceptual misunderstandings.

Organizational Guidelines for students:

(1) As soon as you get your syllabi from your courses, put important dates on a single calendar, clearly labeled.

(2) Stay current in your subjects by setting aside 8 to 10 hours per week to study each subject. You may need more time in some subjects. Spread your per-subject time out over the week. Marathon studying, especially in mathematics, does not work well! So, make a schedule and keep to it! Be flexible enough to make changes in your schedule but don't schedule marathon studying.

(3) Plan ahead so that you get enough sleep before a test or you will not be able to think clearly and logically.

(4) Take advantage of the available outside help for each of your courses. Schedule at least one SI session per week for Math 111.

(5) Plan ahead for all your papers and projects so that studying for tests is not compromised. Create and schedule mini-goals to attain the major goal of completion on time.

(6) Have needed supplies for each course. Make sure you get copies of the e-Reserves PRIOR to the topic for which they are needed.

(7) Follow each syllabus carefully. For Math 111, your homework is listed for each class meeting. Reading the section before coming to class will help your understanding.

Summary of Important Dates:

September 1	Labor Day
September 19	Test 1 at 2:15
September 25	Gateway Exam 1 at 8:30
October 9	Gateway Exam 2 at 8:30
October 13, 14	Mid-semester break
October 17	Test 2 at 2:15
October 28	Gateway Exam 3 at 8:30
November 14	Test 3 at 2:15
November 18	Gateway Exam 4 at 8:30
November 24	Graphing Portfolio Due/ Oral Presentations in class
November 25-30	Thanksgiving Break
December 5	Test 4 at 2:15
December 7	Last Class Day

Notes to the serious student:

1. **How much to study:** Calculus, to some, is a hard subject. It may be your most challenging course this semester. You should spend around 10 hours a week studying calculus, even if you have "seen it before." Don't assume you know the material! Extra time is needed to complete quizzes and the graphing portfolio. If you cannot make this level of time commitment this semester you will likely be better off taking calculus at another time.

2. **How to study:** Students often find calculus texts hard to read. They are not to be read like a novel, or a history or even a biology text. Your text is a reference book and should be read in a series of passes. The first pass through a section, done **before** the class for which the topics will be studied, you should skim through it lightly, reading definition and theorems, and trying to **work** through some of the examples. After class, re-read the text, your notes and/or e-Reserves. Don't expect to understand fully much of what you've read until you start working on the exercises. In fact, you should spend most of your study time working problems, thinking about those problems, and discussing problems. As you get stuck, go back, rereading the text or your notes or the e-Reserves, studying the examples and derivations, on a "need-to-know" basis.

3. **Homework:** Work lots and lots of problems. When you finish the current section, you should go back and work review problems. Furthermore, you have not completed the homework just because you have the right answers, you must understand **why** your methods worked. If all you are doing is blindly applying formulas and mimicking examples, get extra help. The problems should make logical sense to you. You must get to the point where you are able to work problems correctly, from start to finish, without having "to flip" back to the answer or to previous work. Time to reflect on your work helps build confidence and speed and enables you to retain the material.

4. **Studying for tests:** If you were an athlete preparing for track meet, and you slacked off during the weeks before the meet, doing just what you needed so coach wouldn't get on your case, and then stayed up running the whole night before your meet, you'd loose. Many students prepare for tests by cramming; they procrastinate and then believe that they can "stuff in" what they need for success by staying up all night attempting to study. Your brain will not to be in top shape by marathon studying. The right way to study is to do your work at a steady pace throughout the semester. There are a few facts and formulas you'll need to remember for a test. Make note cards for those facts and formulas and "touch base" with them often. In order to think well, you need to rest sufficiently and exercise adequately. Remember that aerobic exercise circulates blood to the body and that includes the brain.

5. **Come to class and use your outside help:** Many college students treat class attendance as optional. This may be fine for some classes; however, for calculus you can get way behind very fast. You should come to class every period unless you are seriously ill. Schedule at least one SI session per week. Stop by and see your instructor during office hours to ask pertinent questions. Take charge of your learning!

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE. BY YOUR SIGNATURE ON SUCH WORK, YOU PLEDGE THAT WORK WAS DONE IN ACCORDANCE WITH THE RULES STIPULATED ON THE WORK OR IN THIS SYLLABUS!

TOPICS/HOMEWORK BY DAY
Mathematics 111, Fall Semester, 2008

NOTES: All tests will be in Seney 209 and 215. Handouts are on e-Reserves. See the class conference for a listing of the handouts as they are available. Bring your copy of the handouts to class.

Wednesday, August 27 — **Review of Functions [Chapter 1]; Introduction to Calculus [2.1]; Limits [2.2]**

p. 8: 1-4, 37, 41, 47, 49, 51, 53
p. 16: 1, 3, 7, 9, 15, 19, 23, 31, 35, 39
p. 27: 1, 7, 13, 15, 29, 51
p. 44: 1, 3, 5, 7, 53, 57, 59, 91, 95
p. 54: 1, 3, 5, 7, 9, 13, 19, 21, 25, 27, 39, 41, 49, 63, 67, 71, 75, 77
p. 57: 1, 7, 13, 17, 19, 21, 25, 34, 35, 36, 51, 53, 57, 59
p. 59: 1, 5, 7, 9
p. 75: 11, 13, 15, 17

Friday, August 29 — **Limits [2.3]**

p. 87: 5-43 (odd), 51-61 (odd)

Monday, September 1 — **Labor Day, no class**

Wednesday, September 3 — **Continuity [2.4]**

p. 98: 1-19 (odd), 25, 27, 63, 65

Friday, September 5 — **Intermediate Value Theorem [2.4]; [Infinite limits [2.5] later in course]**

p. 101: 91-94 (all)
p. 111: 7-10 (all), 15-26 (all), 44-57 (all)
p. 113: 4, 5, 6, 9
Quiz 1

Monday, September 8 — **Definition of Derivative, Tangent Line Problem, Differentiability [3.1]**

p. 124: 5-23 (odd), 33, 35, 39-42 (all), 47, 71-86 (all)

Wednesday, September 10 — **Basic Rules of Differentiation (the constant-multiple, sum, and difference rules; derivatives of powers, transcendental functions) [3.2]**

p. 136: 3-23 (odd), 39-51 (odd), 57-61 (odd), 91-94 (all), 99, 100, 109, 111
Quiz 2

Friday, September 12 — **Product and Quotient Rules, Higher Order Derivatives [3.3]**

p. 147: 3, 4, 5-15 (odd), 23-53 (odd), 69, 71, 73, 75, 83-93 (odd), 103, 105

Monday, September 15 — **Chain Rule [3.4]**

p. 161: 9-35 (odd), 47-54 all, 55-93 (odd), 101-106 (all), 149, 151
Quiz 3

Wednesday, September 17 — **Review of Differentiation**

p. 197: 1-10, 17-32, 37, 41-57, 59-62, 67-96

Friday, September 19 — **Test 1 at 8:30**

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Monday, September 22 — **Implicit Differentiation [3.5]; Derivatives of Arcsine and Arctangent functions [3.6]**

p. 171: 1-38 (all), 41-46 (all), 65-68 (all)
p. 179: 13, 14, 17, 18, 19, 20, 22, 31, 33, 34, 35, 40

Thursday, September 25 — **Gateway Exam 1 at 8:30**

Wednesday, September 24
and
Friday, September 26 — **Related Rates [3.7]**

p. 187: 1-4 (all), 9, 10, 15, 18, 19, 20, 21, 22, 23, 24, 27, 28, 30, 31, 32, 33, 34, 35, 36, 39, 43
p. 199: 119-130 (all) no calculators, 137, 138, 141, 144, 147, 148
p. 201: 4, 9
Quiz 4 (given out on Friday)

Monday, September 29 — **Extrema on an Interval [4.1]**
Mean Value Theorem [4.2]

p. 209: 7-10, 11-38 (odd), 59-62, 66
p. 216: 7-21 (odd), 35-43 (odd)

Wednesday, October 1 — **Graphing Concepts [4.3, 4.4] with Application to Polynomial Functions**

Graphing handout

Friday, October 3 — **Infinite Limits [2.5]**
Limits at Infinity [4.5]

Graphing Handout
Quiz 5

Monday, October 6 — **Graphing Rational Functions [4.6]**

Graphing Handout

Wednesday, October 8 — **Review Differentiation and Graphing**

Thursday, October 9 — **Gateway Exam 2 at 8:30**

Friday, October 10 — **Graphs with Vertical Tangents, Other Types of Graphs [4.6]**

Graphing handout
Quiz 6

Monday, October 13 — **Mid-Semester break**

Wednesday, October 15 — **Review**

Friday, October 17 — **Test 2 at 2:15**

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Monday, October 20
and
Wednesday, October 22 — **Optimization [4.7]**

p. 265: 2-10 (all), 17, 18, 19, 23, 24, 26, 27, 29, 33, 37, 38, 43
p. 280: 80, 81

Friday, October 24 — **Antiderivatives [5.1]**

p. 291: 15-44 (odd), 73-79 (all), 87
Quiz 7

Monday, October 27 — **Sums and Sigma Notation [5.2]**
Induction

p. 303: 7-14 (all)
Induction handout

Tuesday, October 28 — **Gateway Exam 3 at 8:30**

Wednesday, October 29 — **Induction continued…**

Quiz 8

Friday, October 31 — **Definite Integral, Area [5.3]**
Fundamental Theorem of Calculus [5.4]

p. 314: 3, 5, 7, 15, 17, 19, 23-28, 31, 32, 33, 35, 37, 39
p. 327: 5-37 (odd), 41-49 (odd), 85-109 (odd), 139, 140, 141

Monday, November 3 — **Integration by Substitution [5.5]**

p. 340: 7-38 (odd), 47-77 (odd)

Wednesday, November 5 — **More Substitution [5.7, 5.8]**

p. 358: 1-35 (odd)
p. 366: 1-43 (odd)

Friday, November 7 — **Introduction to Differential Equations**
Separation of Variables [6.1, 6.2]

p. 391: 1-9 (all)
p. 400: 1-6 (all), 33-68 (odd)
p. 380: 3-11 (odd), 21, 37-51 (odd), 63-79 (all), 97-114 (all)
Quiz 9

Monday, November 10 — **More integration**

Wednesday, November 12 — **Review**

Friday, November 14 — **Test 3 at 2:15**

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Monday, November 17 — **Area Between Curves [7.1]**

p. 452: 1-6 (all), 15-30 (odd)

Tuesday, November 18 — **Last Gateway Exam, Exam 4 at 8:30**

Wednesday, November 19 — **Volumes of Revolution - Disk Method [7.2]**

p. 463: 1-22 (all), 23-32 (odd)

Friday, November 21 — **Volumes of Revolution - Shell Method [7.3]**

p. 472: 1-20 (all)
p. 513: 1-10 (all), 21-28 (all)

Monday, November 24 — **Graphing Portfolios "Show and Tell"**
Quiz 10

Wednesday, November 26
and
Friday, November 28 — **Thanksgiving break**

Monday, December 1
and
Wednesday, December 3 — **Review Area, Volume, Integration, Differentiation, Limits**

Friday, December 5 — **Test 4 at 2:15**

Monday, December 10 — **Evaluation**