Mathematics 112, Calculus II
Spring, 2014

Mathematics 112 is the second semester of calculus and is designed specifically for students who have completed a semester of college calculus (Math 111, AP Calculus scores of 4 or 5). Course content includes methods of integration, improper integrals, polar coordinates, sequences and infinite series, power series, and introduction to differential equations. Specific topics by class day are attached.

Goals:

Generally, students should grow by learning fundamental principles of mathematics, gaining factual knowledge related to calculus, and learning to apply course material and techniques to more advanced problems.

Building upon Calculus I, students should know and/or demonstrate:

(1) A basic understanding of derivative, of anti-derivative, and of limit.
(2) Use the rules of differentiation as they apply to algebraic and transcendental functions.
(3) Evaluate a variety of limits and appropriately interpret findings.
(4) Sketch graphs of transcendental functions by building on concepts from Calculus I.
(5) All variations for the u-substitution method of integration, definite and indefinite integrals.

Additional goals for Calculus II, students should know and demonstrate:

(6) New methods of integration (parts, trigonometric substitution, partial fractions) for typical indefinite, definite, and improper integrals.
(7) Be able to graph and to find area using simple polar coordinate expressions.
(8) Determine convergence of appropriate infinite series by giving logical arguments.
(9) A basic understanding of power series and be able to determine the domain of appropriate power series.
(10) Be able to derive a power series expression for specified transcendental expressions using a geometric series or Taylor's Theorem.
(11) Be able to solve simple first-order differential equations (separable, exact, linear).

Text Material:

Handouts and Notes are located at the Blackboard online course for Math 112. James Stewart's *Single Variable Calculus: Early Transcendentals 7th edition* is suggested as a reference.

Class Attendance:

The student is responsible for the course material discussed in class; therefore, the student is expected to attend all classes. Generally, students who attend class on a regular basis achieve better grades than those who elect to be absent occasionally. Students accumulating more than three absences, excused or otherwise, will be referred to academic services and will thereafter be penalized one percentage point on their final grade for each additional absence.

Calculators:

Calculators will not be needed nor allowed on tests and quizzes.

Grading:

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

Major tests (4 @ 100 points)	400 points
Quizzes (5 @ 30 points each)	150 points
Project	50 points
Gateway Exam	50 points
Final Exam	250 points
TOTAL	900 points

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

A: 810 or more points
B: 720-809 points
C: 630-719 points
D: 540-629 points
F: fewer than 540 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 800 points. Ultimately, the assignment of plus and minus is dependent on the overall course 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 complete most of the problems assigned. **The student will need to spend at least 10 good hours of study each week, not counting time spent reviewing for tests.**

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 and students will lose more than they retain.

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 and integration techniques. All 50 points will be given for a perfect paper on the Gateway Exam. There will be three opportunities for the student to earn all 50 points with a perfect paper. Students passing the first Gateway Exam will receive a bonus of 20 points. Each student needs to take each scheduled gateway exam until the student passes.

An example Gateway Exam is available on Blackboard. The Gateway Exam will be given during class on the dates indicated on the calendar below. Any student not passing the Gateway Exam will be asked to drop the class.

Quizzes:

All quizzes are announced on the syllabus. A student must be present in class to take the quiz. There is no provision for making up quizzes since two will be dropped. **The Student Honor Code applies to the taking of these quizzes.**

Each quiz will be graded on a basis of 30 points although some quizzes may contain bonus points. Throughout the semester seven quizzes will be given and the best five will be used as part of the grade determination for this course. **Quiz problems will be taken directly from the homework assignments.**

Project:

There will be a project related to integration techniques due after the first test. Students may be permitted to work in groups of two or three for this assignment. Further details on the assignment will be posted on Blackboard.

Major Tests:

Each test will be given across two days as indicated on the calendar below. The final exam will be given according to the exam schedule and will be comprehensive.

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. Arrangements must be made several days in advance. No retests will be permitted.

Any student requiring special accommodations must present their letter of accommodation provided by the college; the student must make arrangements for these accommodations several days in advance of the scheduled test date.

Responsibilities

Of the Student:

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, online course material).
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!

Of the 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. Establish and foster 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, is to be consistent and impersonal even though students might not agree with the decisions concerning partial credit.

Support Services:

Students are expected to use the following:

Office hours will be posted on Blackboard. Students should use this time to come by and ask specific questions related to this course. There is a study area outside Pierce 122 for you to use.

There is a **Blackboard online course**, Spring 2014 Math 112. Students should consult Blackboard frequently for announcements about office hours, SI sessions, tutoring, handouts, class notes and homework assignments. These handouts provide problems and explanations for the material being studied. Students may pose individual questions on the discussion boards.

There are **Supplemental Instruction (SI) leaders** for Math 112. Our student SI leaders will schedule review sessions each week, the topic for which will be posted on Blackboard. Each student is encouraged to attend regularly. Even though these sessions are optional, students who regularly attend SI sessions generally do better in the courses for which there are SI leaders.

Student tutors are available Monday through Thursday from 3pm to 6pm. Tutors may be found in the Mathematics Center in Pierce Hall.

Study groups organized by students are highly recommended. For these to be profitable, the meetings should be scheduled weekly and should be part of a regular weekly routine.

Summary of Important Dates:

January 20	Martin Luther King Jr. Holiday
January 21	Last Day for Changing Courses
March 7	Last Day to Drop
March 10-14	Spring Break
April 4	Last Day to Petition for Freshmen Withdrawal
April 28	Last Class Day

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL ASSIGNMENTS IN THIS COURSE. BY YOUR SUBMISSION OF SUCH WORK, YOU PLEDGE THAT WORK WAS DONE IN ACCORDANCE WITH THE RULES STIPULATED ON THE ASSIGNMENT OR IN THIS SYLLABUS.

TOPICS BY DAY
Mathematics 112, Spring Semester, 2014

NOTES:

* Handouts, homework, class notes are on the Blackboard online course.
* Refer to the online course for homework assignments.
* Come to class ready to work problems, not merely to copy or to observe the instructor.
* Read the syllabus carefully, you are responsible for the content.

Monday	Wednesday	Friday
	1/15: Calculus I Review	1/17: Integration by Parts
1/20: *MLK Jr. Holiday* (No Class) 1/21: Last Day for Class Change	1/22: Trigonometric Substitution	1/24: Partial Fractions
1/27: Partial Fractions, cont. **Quiz 1**	1/29: Graphing Logarithmic and Exponential Graphs	1/31: Review
2/3: Review **Gateway Exam 1**	2/5: **Test 1, Part 1**	2/7: **Test 1, Part 2**
2/10: L'Hôpital's Rule	2/12: Improper Integrals	2/14: Polar Coordinates **Project Due**
2/17: **Quiz 2** **Gateway Exam 2**	2/19: Polar Coordinates	2/21: Review **Quiz 3**
2/24: Review	2/26: **Test 2, Part 1**	2/28: **Test 2, Part 2**

Monday	Wednesday	Friday
3/3: Infinite Sequences **Gateway Exam 3**	3/5: Infinite Series; nth Term Test	3/7: Integral Test; p-Series Last Day to Drop
3/10: *Spring Break* (No Class)	3/12: *Spring Break* (No Class)	3/14: *Spring Break* (No Class)
3/17: Comparisons of Series	3/19: Alternating Series **Quiz 4**	3/21: Ratio and Root Tests
3/24: Review **Quiz 5**	3/26: Review	3/28: **Test 3, Part 1**
3/31: **Test 3, Part 2**	4/2: Introduction to Differential Equations	4/4: Introduction to Differential Equations, cont. Freshman Drop Deadline
4/7: Power Series	4/9: Power Series, cont. **Quiz 6**	4/11: Power Series, cont.
4/14: Taylor and Maclaurin Series	4/16: Taylor and Maclaurin Series, cont.	4/18: Taylor and Maclaurin Series, cont. **Quiz 7**
4/21: Review	4/23: **Test 4, Part 1**	4/25: **Test 4, Part 2**
4/28: *Last Day of Class* Review for Final Exam		**Final Exams:** 08A: Friday, May 2: 2-5 10A: Monday, May 5: 9-12 12A: Wednesday, April 30: 9-12