

MATH 251-02
ANALYTIC GEOMETRY AND CALCULUS II

Meets: Monday, Wednesday and Friday **Time:** 9:00-10:10 **Room:** 105A

STUDENT LEARNING OUTCOMES

Upon successful completion of Math 251, the student should be able to:

- Choose and apply appropriate integration techniques.
- Model and solve problems involving areas, volume, work and elementary differential equations.
- Apply Calculus techniques using polar and parametric equations including: slope of tangent lines, arc length, graphing, and areas. Find and apply power series representations of functions and determine possible errors, radius of convergence, and corresponding derivatives and integrals.
- Determine if sequences or series converge or diverge using appropriate theorems.

INSTRUCTOR CONTACT INFORMATION AND OFFICE HOURS

Instructor: Shannon Gracey **Phone:** 619-421-6700 ext. 5517

e-mail: sgracey@swccd.edu **website:** www.swccd.edu/~sgracey

Office Hours: Room 320D, MW 10:15-11:55, F 10:15-11:05 or you may make an appointment by calling or e-mailing me, using the contact info written above.

COURSE MATERIALS

Text: *Calculus, 8th ed.*, Larson, Hostetler, and Edwards

Calculator: A graphing calculator is REQUIRED. TI 84 is recommended.

PREREQUISITES AND RECOMMENDED PREPARATION

Prerequisite: MATH 250

Recommended Preparation: RDG 56 or the equivalent skill level as determined by the Southwestern College Reading Assessment or equivalent

ATTENDANCE & TARDIES

Each student is responsible for his/her registration in classes. Each student must attend the first class meeting or make arrangements with the instructor if he/she is going to be absent. Failure to attend the first class meeting or excessive unexcused absences, that is, more than 8 hours of missed class time, may result in a student being dropped from this class. Each class you will be given 2 points if you arrive on time and stay for the entire class, 1 point if you arrive late or leave early, and 0 points if you are absent. At the end of the semester this percentage $\{(earned\ points)/(points\ possible)\} \times 100$ will replace your lowest quiz percentage.

HOMEWORK

Homework will be collected on exam and quiz days at the beginning of the class. Homework is graded on completeness. Each new assignment must be started on a new paper, be clearly labeled with the chapter, section, and assignment, and stapled. **Graphs must be on GRAPH PAPER!** In order to be successful in this course, **YOU MUST PRACTICE MATH PROBLEMS EVERY DAY!!! No late homework will be accepted.**

QUIZZES & EXAMS

Quizzes will typically be given after covering 3-4 sections, between exams. There will be at least 4 quizzes. No quizzes will be dropped, however your lowest quiz score may be replaced by your attendance percentage. Exams will typically be given at the end of each even chapter and will also cover the previous odd chapter. No exams are dropped, however your lowest exam score may be replaced by your earned homework percentage.

QUESTIONS

Questions are an important part of the learning process. If you have a question, please feel free to ask me at any time! If you have a question, there are probably at least 5 other students with the same question. If I cannot answer your question immediately, I will come back to it ASAP.

DISABILITY SUPPORT SERVICES (DSS)

DSS provides programs and services for students with disabilities. Southwestern College recommends that students with disabilities discuss academic accommodations with their professors during the first two weeks of class. This syllabus and course handouts are available in alternate media upon request.

TUTORING AND ACADEMIC SUCCESS CENTER REFERRAL

To further your success, reinforce concepts, and achieve the stated learning objectives for this course, I refer you to Academic Success Center learning assistance services. You will be automatically enrolled in NC 3: Supervised Tutoring, a free noncredit course that does not appear on your transcripts. Services are located in the ASC (420), the Writing Center (420D), the Reading Center (420), Math Center (426), the Library/LRC Interdisciplinary Tutoring Lab, MESA (396), specialized on-campus School tutoring labs, the Higher Education Center, and the San Ysidro Education Center. Online learning materials and Online Writing Lab (OWL) are available at www.swccd.edu/~asc.

BEHAVIOR

- **CHEATING ON ANY TEST OR QUIZ WILL EARN A GRADE OF F!!! PLAGIARISM (COPYING) OF OTHER PEOPLE'S WORK IS NOT ACCEPTABLE.** Any person caught doing this will get an F on the assignment or test in question and can also potentially be given a grade of F for the course and/or be referred to the college discipline process.

- You may not use your cell phone or PDA as a calculator on exams.
- During class your cell phone/pager should be off.
- If you know you need to leave class early, take a seat near the door.
- **RESPECT YOUR FELLOW STUDENTS AT ALL TIMES!!!**

GRADING

Exams (4—MAKE-UPS ARE GRANTED ONLY IF I AM NOTIFIED <u>BEFORE THE EXAM</u>)	55%
Quizzes (MAKE-UPS ARE GRANTED ONLY IF I AM NOTIFIED <u>BEFORE THE EXAM</u>).....	20%
HOMEWORK (NO LATE ASSIGNMENTS ACCEPTED).....	5%
Final (CUMULATIVE).....	20%
A: 90%—100% B: 80%— 89% C: 70%— 79% D: 60%— 69% F: 59% and below	
<i>Final grades are left to the discretion of the instructor.</i>	

As a final note: To be successful in this course, it is recommended that you spend 2 hours outside of class for every hour in class.

STUDENT LEARNING OBJECTIVES

1. Student will (Inverse Trigonometric Functions) define each including the domains and ranges; evaluate limits and integrate and differentiate functions involving inverse trigonometric functions.
2. Student will (Hyperbolic Functions) define each in terms of the exponential function; derive the identities which involve hyperbolic functions; derive the formulas for their derivatives; integrate and differentiate functions involving hyperbolic functions; derive the definition of the inverse hyperbolic function in terms of the natural logarithm; integrate and differentiate functions involving inverse erbolic functions.
3. Student will (Integration) given an algebraic, exponential or logarithmic function, select a suitable method from those listed and find the correct antiderivative; integration by parts, trigonometric substitution, partial fractions, completion of the square in a quadratic equation, other appropriate substitutions; given a trigonometric function, find its antiderivative by substitution and the use of identities; given any function and a table of integral, make the proper substitutions and find the antiderivative; given an improper integral with infinite limits or a discontinuous integral, determine whether it converges or diverges and if it converges, evaluate it.
4. Student will identify a limit which is of indeterminate form and, find the limit if it exists, or; establish that the limit does not exist.
5. Student will (Sequences and Series) define an infinite sequence; define the sum of an infinite series in terms of the limit of an infinite sequence; identify geometric, harmonic and p-series; given a series of positive terms choose an appropriate test from those listed and determine whether or not the series converges; integral test, comparison test, ratio test, root test; given an alternating series, apply the alternating series test and, if convergent, determine whether it converges absolutely or conditionally; given a power series, find its interval of convergence; given a function, generate a series for it using one of the methods listed and establish the interval of convergence: Taylor's theorem, geometric series, binomial series and other series.
6. Student will (Plane Analytic Geometry) given the equation of a conic in standard form, sketch its graph; given characteristics such as focus, directrix, etc., find the equation of a conic in rectangular or polar form; translate and rotate axes, if necessary, to change the equation of a conic to standard form; graph functions which are given in polar form; graph the portion of a curve represented by a pair of parametric equations and describe the motion of a point on the curve as a function of its parameter; identify and sketch conic sections which are given in polar form; convert a polar equation to one in rectangular form and vice versa; given a curve in polar of parametric form, find the equation of the tangent line to the curve at a given point.
7. Student will (Applications) find the moment and centroid of a plane region; find the hydrostatic force exerted on a surface; find the area of a region which is described by a polar equation; find the length of a curve which is described by a polar equation or by parametric equations; find the area of a surface of revolution which is given by a polar of rectangular equation or by parametric equations; solve differential equations.
8. Student will find volumes of solids of revolution using the disk method and the shell method. Find arclength and surface areas for solids of revolution.

TOPICS COVERED

Chapter 5: Other Transcendental Functions

- 5.6 Inverse Trigonometric Functions: Differentiation
 - 5.7 Inverse Trigonometric Functions: Integration
 - 5.8 Hyperbolic Functions
- ### Chapter 7: Applications of Integration

- 7.2 Volume: The Disk Method
- 7.3 Volume: The Shell Method
- 7.4 Arc Length and Surfaces of Revolution
- 7.5 Work

Chapter 8: Integration Techniques, L'Hôpital's Rule, and Improper Integrals

- 8.1 Basic Integration Rules
- 8.2 Integration by Parts
- 8.3 Trigonometric Integrals
- 8.4 Partial Fractions
- 8.5 Partial Fractions
- 8.6 Integration by Tables and Other Integration Techniques
- 8.7 Indeterminate Forms and L'Hôpital's Rule
- 8.8 Improper Integrals

Chapter 9: Infinite Series

- 9.1 Sequences
- 9.2 Series and Convergence
- 9.3 The Integral Test and p -Series
- 9.4 Comparisons of Series
- 9.5 Alternating Series
- 9.6 The Ratio and Root Tests
- 9.7 Taylor Polynomials and Approximations
- 9.8 Power Series
- 9.9 Representation of Functions by Power Series
- 9.10 Taylor and Maclaurin Series

Chapter 10: Exponents, Polynomials, and Polynomial Functions

- 10.1 Conics and Calculus
- 10.2 Plane Curves and Parametric Equations
- 10.3 Parametric Equations and Calculus
- 10.4 Polar Coordinates and Polar Graphs
- 10.5 Area and Arc Length in Polar Coordinates

Please return this page to Ms. Gracey on the second day of class. Be sure to print your name clearly so that I can give you credit.

I, _____, have read the course syllabus. I understand that I am required to follow the policies outlined in the syllabus. I also understand that this course will require approximately 8-10 hours of productive study time **outside of class** in order for me to have a chance of successfully completing this course. I understand that I must complete the homework in order for me to have a chance of successfully completing this course.

Signature

Date

TENTATIVE SCHEDULE
FALL 2009
MATH 251-02

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
AUGUST	17 Intro, review	18	19 5.6	20	21 5.6 CONT.
AUGUST	24 5.7	25	26 5.7 CONT.	27	28 5.8 SAT. 8/29 IS THE LAST DAY TO ADD OR WITHDRAW W/REFUND
AUGUST/ SEPTEMBER	31 5.8 CONT.	1	2 QUIZ 1/ CH. 5.6-5.8	3	4 Review area between curves, 7.2
SEPTEMBER	7 HOLIDAY	8	9 7.2, 7.3	10	11 7.3 LAST DAY TO DROP W/O RECEIVING A W OR APPLY FOR C/NC—3PM
SEPTEMBER	14 7.4	15	16 7.4 CONT.	17	18 7.5
SEPTEMBER	21 REVIEW	22	23 EXAM 1/ CH. 5.6-5.8, 7.1-7.5	24	25 8.1
SEPTEMBER/ OCTOBER	28 8.2	29	30 8.3	1	2 QUIZ 2/ CH. 8.1-8.3
OCTOBER	5 8.4	6	7 8.5	8	9 QUIZ 3/ CH. 8.4-8.5
OCTOBER	12 8.7	13	14 8.8	15	16 Review Ch. 8
OCTOBER	19 EXAM 2/ CH. 8.1-8.8	20	21 9.1	22	23 9.2
OCTOBER	26 9.3	27	28 QUIZ 4/ CH. 9.1- 9.3 9.4	29	30 9.5 DEADLINE TO PETITION FOR FALL GRADUATION
NOVEMBER	2 9.6	3	4 9.7	5	6 9.8 LAST DAY TO DROP AND RECEIVE A W— 3PM
NOVEMBER	9 9.9	10	11 HOLIDAY	12	13 9.10
NOVEMBER	16 Review Ch. 9	17	18 EXAM 3/CH. 9	19	20 10.1
NOVEMBER	23 10.2	24	25 10.3	26 HOLIDAY	27 HOLIDAY
DECEMBER	30 10.4	1	2 10.5	3	4 Review Ch. 10.1- 10.5
DECEMBER	7 EXAM 4/ CH. 10.1- 10.5	8	9 REVIEW FOR FINAL	10 NO CLASSES	11 NO CLASSES
DECEMBER	14	15	16 FINAL 8AM-10AM	19	20