

**Penn State University - University Park**  
**MATH 140, Calculus with Analytic Geometry I**  
**Fall 2011**

**CATALOG DESCRIPTION:** **MATH 140** (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4 semester hours)  
Functions, limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may only take one course for credit from MATH 110, 140, 140A, 140B, 140E, 140G, and 140H.

**PREREQUISITE:** Math 22 AND 26; or Math 40 or Math 41; or satisfactory performance on the algebra and trigonometry math proficiency examination.

**TEXT:** Calculus, Seventh Edition, (OR) Calculus(Single Variable), Seventh Edition, by James Stewart, published by Thomson (Brooks/Cole). An electronic version of the text (e-text) is available chapter by chapter through <http://pennstate.ichapterssites.com>

**COURSE FORMAT:** There are four 50-minute lectures each week. The sections covered in lectures are listed at the end of this syllabus.

**MATH 140 LEARNING OBJECTIVES :**

Upon successful completion of Math 140, the student should be able to:

1. Calculate or estimate limits of functions given by formulas, graphs, or tables.
2. Determine whether a function given by a graph or formula is continuous at a given point or on a given interval or on its domain.
3. Determine whether a function given by a graph or formula is differentiable at a given point or on a given interval.
4. Distinguish between average and instantaneous rate of change and interpret the definition of the derivative graphically.
5. Determine derivatives of some functions using the limit definition of the derivative.
6. Calculate derivatives of polynomial, rational, and common transcendental functions, and combinations of these functions.
7. Calculate derivatives of composite functions.
8. Calculate derivatives of implicitly defined functions.
9. Give examples to illustrate important theorems.  
(Intermediate Value Thm, Rolle's Thm, Mean Value Thm, Extreme Value Thm, Squeeze Thm)
10. Apply the ideas and techniques of derivatives to related rate problems.
11. Apply the ideas and techniques of derivatives to finding local and absolute extrema.
12. Apply the ideas and techniques of derivatives to graphing functions.
13. Apply the ideas and techniques of derivatives to optimization problems.
14. Find linear approximations of functions (differentials).
15. Calculate the Riemann sum for a given function and partition.
16. Describe a definite integral as the limit of a Riemann sum.
17. Determine antiderivatives of some algebraic functions and some trigonometric functions.
18. Calculate values of definite integrals using antiderivatives and areas.
19. Use the Fundamental Theorem of Calculus to determine the derivative of an integral.
20. Use the Fundamental Theorem of Calculus to evaluate definite integrals.
21. Apply substitution techniques to integrate functions.
22. Apply the ideas of definite integrals to calculate the area of a region between curves.
23. Apply the ideas of definite integrals to calculate the volume of a solid of revolution rotated about a coordinate axis.
24. Apply the ideas of definite integrals to calculate the volume of a solid of revolution rotated about a line parallel to a coordinate axis.
25. Synthesize concepts from two or more separate sections of the text.

**CALCULATORS:** A graphics calculator is useful as a study and learning tool when used appropriately, but it is not essential. Calculus is a collection of ideas that are not mastered through calculator skills. **No calculators** are allowed on quizzes, midterms, or on the final examination.

**TUTORS AND MATH CENTER:** Free mathematics tutoring is available at Penn State Learning located in 220 Boucke Building. For more information, go to the [PSU Learning](#) webpage.

**EXAMINATIONS:** Two 75-minute evening examinations will be given during the semester and a comprehensive final examination will be given during the final examination period. NO books, notes, or calculators may be used on the examinations. You must bring your University ID card to all exams. The examinations will be given from **6:30 to 7:45 PM** on the following dates:

Midterm Examination I	Monday, October 3
Midterm Examination II	Tuesday, November 1

Rooms for examinations will be announced by your instructor at a later date and may also be found on the [Courses](#) website

**CONFLICT EXAMINATIONS:** For the two mid-semester examinations, there is a conflict examination from **5:05 to 6:20 PM** on the same night as the regular examination.

**Who may take the Conflict Exam?** If you have a valid conflict with the regular examination time, such as a class or other scheduled activity, you may sign up for the conflict exam.

**How and when to sign up for the Conflict Exam.** Students must sign up for the Conflict Exam **in class, with your instructor, on a pink form**. The student is responsible for knowing the room and time of the conflict examination. This information is on the pink form. Your instructor must turn in the pink form **2 class days** prior to the examination date. If you have not signed up with your instructor, you will not be allowed to take the conflict exam.

**Instructions on Conflict Exam night.** The student is responsible for knowing the room and time of the conflict examination. **Each student must bring his or her University ID to the conflict examination.** The ID will be checked by the proctor. **Although the conflict examination will end at 6:20 PM, no student will be permitted to leave the examination room before 6:25 PM.** Any student who leaves before 6:25 PM will receive a grade of zero on the examination and will not be allowed to retake it.

**MAKEUP EXAMINATIONS:** A makeup exam will be given about a week after the regularly scheduled exam.

**Who may take the makeup exam?** Students who have a valid documented reason, such as a class conflict or illness, during both the conflict and regular examination times are permitted to schedule a makeup examination with no penalty. You must be prepared to verify the reason for taking the makeup. **Personal business such as travel, employment, weddings, graduations, or attendance at public events such as concerts, sporting events, and Greek Rush events are not valid excuses.** **Forgetting the date, time or room of an examination is not a valid excuse.** Students who do not have a valid reason for missing the examination are permitted to schedule the makeup, but 20 points will be deducted from their score. Students who have taken either the regularly scheduled examination or conflict examination are not permitted to take the makeup examination. The makeup examinations are given from 6:30 to 7:45 PM on the evenings listed below:

Makeup Examination I	Tuesday, October 11
Makeup Examination II	Monday, November 7

**How and when to sign up for the Makeup Exam.** Students who are ill on exam night must contact their instructor within 24 hours of the exam. Students must sign up for the Makeup Exam **in class, with your instructor, on a yellow form**, as soon as possible following the regular exam date. The student is responsible for knowing the room and time of the makeup examination. This information is on the yellow form. Your instructor must turn in the yellow form **2 class days** prior to the examination date. If you have not signed up with your instructor, you will not be allowed to take the makeup exam.

**Instructions on Makeup Exam night.** The student is responsible for knowing the room and time of the makeup examination. **Each student must bring his or her PSU ID to the makeup examination.** The ID will be checked by the proctor.

**What if a student misses both the regularly scheduled exam and the makeup exam?** If a student misses both the regularly scheduled examination and the scheduled makeup due to a valid, verifiable reason, it may be possible to take a makeup examination by appointment. All such makeup examinations must be scheduled through the instructor with the approval of the course coordinator and must be completed no later than one week after the scheduled makeup examination.

**FINAL EXAMINATION:** The final examination will be given during the week, December 12-16, 2011. **The final examination may be scheduled on any day during the final examination period. Do not plan to leave University Park until after Fri, December 16, 2011.** Students may access their final exam schedule Monday, September 26, through their e-lion accounts. Notification of conflicts is given on the student's final exam schedule. There are two types of conflict examinations, direct and overload. Direct conflicts are two examinations scheduled at the same time. Overload examinations are three or more examinations scheduled within a fifteen hour period, from the beginning of the first examination to the beginning of the third examination. Students may elect to take the three or more examinations on the same day if they wish or request a conflict final examination. **A student must take action to request a conflict exam through e-lion between September 26 and October 14, 2011. Conflict final examinations cannot be scheduled through mathematics department, and there will be no sign up sheet in 104 McAllister for the final conflict examination.** Students who miss or cannot take the final examination due to a valid and documented reason, such as illness, may be allowed to take a makeup final examination. **Personal business, such as travel, employment, weddings, graduations, or attendance at public events such, as concerts, sporting events are not valid excuses. Forgetting the date, time, or room of an examination is not a valid excuse.** If the student does not have a valid reason, at least a 30-point penalty will be imposed. All such makeup examinations must be arranged through the instructor with the approval of the course coordinator, and students in such a situation should contact their instructor within 24 hours of the scheduled final examination. Students who have taken the original final examination are not permitted to take a makeup examination.

**COURSE GRADES:** Grades will be assigned on the basis of 450 points, distributed as follows:

Examination I	100
Examination II	100
Homework and/or quizzes	100
Final Examination	150
Total	450

Final course grades will be assigned as follows:

<b>A</b>	415-450 POINTS
<b>A-</b>	405-414 POINTS
<b>B+</b>	395-404 POINTS
<b>B</b>	370-394 POINTS
<b>B-</b>	360-369 POINTS
<b>C+</b>	350-359 POINTS
<b>C</b>	315-349 POINTS
<b>D</b>	270-314 POINTS
<b>F</b>	000-269 POINTS

After the second exam and before the late-drop deadline the guaranteed grade-line cutoffs will be provided to facilitate your planning for the rest of the semester. The unavoidable consequence is that some students are just "a point" away from the higher grade. For the reason of fairness, the policy in this course is to NOT adjust individual grades in such circumstances.

**NOTE:** Your grade will be based **EXCLUSIVELY** on the midterm examinations, homework and/or quizzes and final examination. **There is no "extra-credit" work.**

**DEFERRED GRADES:** Students who are currently passing a course but are unable to complete the course because of illness or emergency may be granted a deferred grade which will allow the student to complete the course within the first six weeks of the following semester. Note that deferred grades are limited to those students who can verify and document a valid reason for not being able to take the final examination. For more information see [DF grade](#)

**LATE-DROP:** Students may add/drop a course without academic penalty within the first ten calendar days of the semester. A student may late drop a course within the first twelve weeks of the semester but accrues late drop credits equal to the number of credits in the dropped course. A baccalaureate student is limited to 16 late drop credits. The late drop deadline for Fall 2010 is **November 11, 2011**.

**ACADEMIC INTEGRITY:** Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

*Academic dishonesty includes, but is not limited to, cheating, plagiarizing, [...], facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with academic work of other students. [...] A student charged with academic dishonesty will be given oral or written notice of the charge by the instructor. If students believe that they have been falsely accused, they should seek redress through informal discussions with the instructor, the department head, dean or campus executive officer. If the instructor believes that the infraction is sufficiently serious to warrant the referral of the case to Judicial Affairs, or if the instructor will award a final grade of F in the course because of the infraction, the student and instructor will be afforded formal due process procedures.*

*From Policies and Rules, Student Guide to the University Policy 49-20.*

Based on the University's [Faculty Senate Policy 49-20](#), a range of academic sanctions may be taken against a student who engages in academic dishonesty. Please see the [Eberly College of Science Academic Integrity homepage](#) for additional information and procedures.

**QUESTIONS, PROBLEMS, OR COMMENTS:** If you have questions or concerns about the course, please consult your instructor first. If further guidance is needed, you may contact the course coordinator whose contact information is given below.

### **Course Coordinator**

Dr. Cindy Parsons, Senior Instructor and Calculus Coordinator  
104 McAllister Building  
University Park, PA 16802  
Telephone: 814-865-7528  
E-mail: calculus@math.psu.edu

**Include your Name, Student ID, Course, and Section Number in any correspondence**

## SUGGESTED LECTURE SCHEDULE

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
1	Monday	Aug 22	Introduction	Tangent & Velocity Problems	CLASS BEGINS Readiness Quiz online
	Tuesday	Aug 23	1.4	Tangent & Velocity Problems	
	Wednesday	Aug 24	1.5	Limit of a Function	
	Thursday	Aug 25			
	Friday	Aug 26	1.6	Calculating Limits; Limit Laws	
2	Monday	Aug 29	1.6	Calculating Limits; Limit Laws	
	Tuesday	Aug 30	1.8	Continuity	
	Wednesday	Aug 31	1.8	Continuity	Readiness Quiz Deadline DROP/ADD ENDS
	Thursday	Sept 1			
	Friday	Sept 2	2.1	Derivatives and Rates of Change	
3	Monday	Sept 5	No Class		LABOR DAY
	Tuesday	Sept 6	2.2	Derivative as a Function	
	Wednesday	Sept 7	2.2	Derivative as a Function	
	Thursday	Sept 8			
	Friday	Sept 9	2.3	Differentiation Formulas	
4	Monday	Sept 12	2.3	Differentiation Formulas	
	Tuesday	Sept 13	Trig	Brief Trig Review	
	Wednesday	Sept 14	2.4	Derivatives of Trig Functions	
	Thursday	Sept 15			
	Friday	Sept 16	2.4	Derivatives of Trig Functions	
5	Monday	Sept 19	2.5	Chain Rule	
	Tuesday	Sept 20	2.5	Chain Rule	
	Wednesday	Sept 21	2.6	Implicit Differentiation	
	Thursday	Sept 22			
	Friday	Sept 23	2.6	Implicit Differentiation	
6	Monday	Sept 26	2.7	Rates of Change in Nat and Soc Sciences	
	Tuesday	Sept 27	2.8	Related Rates	
	Wednesday	Sept 28	2.8	Related Rates	
	Thursday	Sept 29			
	Friday	Sept 30	2.8/Review	Related Rates/Review	

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
7	<b>Monday</b>	<b>Oct 3</b>	Review	Review	<b>EXAM 1</b>
	Tuesday	Oct 4	2.9	Linear Approx & Differentials	
	Wednesday	Oct 5	2.9	Linear Approx & Differentials	
	Thursday	Oct 6			
	Friday	Oct 7	3.1	Maximum & Minimum Values	
8	Monday	Oct 10	3.1	Maximum & Minimum Values	
	Tuesday	Oct 11	3.2	The Mean Value Theorem	
	Wednesday	Oct 12	3.3	Derivatives and Graphs	
	Thursday	Oct 13			
	Friday	Oct 14	3.3	Derivatives and Graphs	
9	Monday	Oct 17	3.4	Limits at Infinity; Horizontal Asymptotes	
	Tuesday	Oct 18	3.4-3.5	HA, Curve Sketching	
	Wednesday	Oct 19	3.5	Curve Sketching	
	Thursday	Oct 20			
	Friday	Oct 21	3.5	Curve Sketching	
10	Monday	Oct 24	3.7	Optimization Problems	
	Tuesday	Oct 25	3.7	Optimization Problems	
	Wednesday	Oct 26	3.7	Optimization Problems	
	Thursday	Oct 27			
	Friday	Oct 28	3.9	Antiderivatives	
11	Monday	Oct 31	Review	Review	
	<b>Tuesday</b>	<b>Nov 1</b>	<b>Review</b>	<b>Review</b>	<b>EXAM 2</b>
	Wednesday	Nov 2	4.1	Areas	
	Thursday	Nov 3			
	Friday	Nov 4	4.1	Areas	
12	Monday	Nov 7	4.2	The Definite Integral	
	Tuesday	Nov 8	4.3	Fundamental Theorem of Calculus	
	Wednesday	Nov 9	4.3	Fundamental Theorem of Calculus	
	Thursday	Nov 10			
	Friday	Nov 11	4.4	Indefinite Integrals	LATE DROP DEADLINE

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
13	Monday	Nov 14	4.5	Substitution Rule	
	Tuesday	Nov 15	4.5	Substitution Rule	
	Wednesday	Nov 16	5.1	Areas Between Curves	
	Thursday	Nov 17			
	Friday	Nov 18	5.1	Areas Between Curves	
14	Monday	Nov 21			THANKSGIVING BREAK
	Tuesday	Nov 22			THANKSGIVING BREAK
	Wednesday	Nov 23			THANKSGIVING BREAK
	Thursday	Nov 24			THANKSGIVING BREAK
	Friday	Nov 25			THANKSGIVING BREAK
15	Monday	Nov 28	5.2	Volumes	
	Tuesday	Nov 29	5.2	Volumes	
	Wednesday	Nov 30	5.3	Volumes by Cylindrical Shells	
	Thursday	Dec 1			
	Friday	Dec 2	5.3	Volumes by Cylindrical Shells	
16	Monday	Dec 5	Ch 5	Areas & Volumes – mixed practice	
	Tuesday	Dec 6	Review Ch 4	Integrals	
	Wednesday	Dec 7	Review Ch 3	Graphing, Optimization	
	Thursday	Dec 8			
	Friday	Dec 9	Review, Ch. 1-2	Limits, Derivatives	CLASS ENDS