Penn State University - University Park
MATH 140, Calculus with Analytic Geometry I
Fall 2017

CATALOG DESCRIPTION: MATH 140 (GQ) CALCULUS WITH ANALYTIC GEOMETRY I (4 credits) Functions, limits; analytic geometry; derivatives, differentials, applications; integrals, applications. Students may only take one course for credit from MATH 110, 140, 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 (ALEKS).

TEXT: Calculus, Eighth Edition, (OR) Calculus(Single Variable), Eighth Edition, by James Stewart, published by Cengage.

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

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 is not mastered through calculator skills. **No calculators** are allowed on quizzes, midterms, or on the final examination.

TUTORS and PENN STATE LEARNING: Free mathematics tutoring is available at Penn State Learning located in 220 Boucke Building. Tutoring will begin during the second week of the semester. For more information, go to PSU Learning. For more help, a private tutor list is available at Courses then scroll to Additional Information for the link.

EXAMINATIONS: Two 75-minute evening examinations will be given during the semester and a 110 minute 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 **6:00 to 7:15 PM** on the following dates:

Midterm Examination I	Monday, October 2
Midterm Examination II	Tuesday, October 31

Rooms for examinations will be announced by your instructor at a later date and may also be found on the Courses website when they are available. It is not permissible to take the exam in a different instructor's assigned room.

CONFLICT – MAKEUP EXAM POLICY: In addition to the two regularly scheduled midterm examinations, the math department schedules two additional options: a conflict exam for each of the midterms from 4:35 - 5:50 pm on the same night as the regularly scheduled exam and a makeup exam scheduled on an evening different from that of the regularly scheduled exam. Students who attend the conflict exam will not be permitted to leave before 5:55. Sign-up sheets for both the conflict exam and the makeup exam will be distributed by your instructor during class. If you need to schedule the conflict exam, you must sign up **at least one full week** ahead of the scheduled exam date. A valid conflict/makeup reason is required to sign up for either of these exams; when signing up, you must include a computer printout of your academic schedule, including your name, so your instructor can validate your request. It is the student's responsibility to sign up and to note the time and location of the makeup or conflict exam; that information is on the signup sheet**. It is the student's responsibility to sign up on the appropriate sheet**.
NOTE: If you miss an exam without an official excuse (such as illness or official university business), you *may* be allowed to take a makeup exam, but with an automatic 20 point deduction from the grade. To avoid this deduction, you must notify your instructor with your official excuse, before the date and time of the makeup exam. This notification may be performed in person, via e-mail, or by telephone.

Who may take the Conflict Exam? If there is a valid, documented conflict with the regular examination time, such as a class or another official university activity, a student may sign up for the conflict exam. If (s)he has not signed up for the conflict exam a week in advance, he or she will not be permitted to take the 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 5:50 PM, no student will be permitted to turn on his/her cell phone nor leave the examination room before 5:55 PM.** Any student who leaves before 5:55 PM will receive a grade of zero on the examination and will not be allowed to retake it.

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. The student 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, is not a valid excuse. 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 6:00 to 7:15 PM on the evenings listed below:

Makeup Examination I	Thursday, October 5
Makeup Examination II	Monday, November 6

How and when to sign up for the Makeup Exam. A student who is ill on exam night must contact his or her instructor within 24 hours of the exam. Students must sign up for the Makeup Exam **in class 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. Instructors must turn in the yellow form **3 class days** prior to the examination date. If a student has not signed up with his or her instructor, the student 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 classroom 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 11-15, 2017. **The final examination may be scheduled on any day during the final examination period. Do not plan to leave University Park until after Friday, December 15, 2017.** Students may access their final exam schedules Monday, September 25, through their Lionpath account. 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 defined as three or more examinations scheduled in consecutive time periods or within one calendar day. 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 Lionpath between September 25 and October 15, 2017. Conflict final examinations cannot be scheduled through the Mathematics department, and there will be no sign up sheet in class 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 at the beginning of the next semester. **Personal business, such as travel, employment, weddings, graduations, or attendance at public events such, as concerts and sporting events is not a valid excuse. Forgetting the date, time, or room of an examination is not a valid excuse.** If the student does not have a valid reason, as explained above, 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 instructors within 24 hours of the scheduled final examination. Students who have taken the original final examination are not permitted to take a makeup examination.

LATE-DROP: Students may add/drop a course without academic penalty within the first six calendar days of the semester. A student may late drop a course within the first twelve weeks of the semester. After the first six days and before deciding to late drop this course, each student should consult with his or her academic advisor. The late drop deadline for Fall 2017 is **November 10, 2017.**

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:

Grade	Raw Score	Percent Score
A	417-450 POINTS	93% - 100%
A-	403-416 POINTS	90%-92%
B+	390-402 POINTS	87%-89%
B	372-389 POINTS	83%-86%
B-	358-371 POINTS	80%-82%
C+	345-357 POINTS	77%-79%
C	313-344 POINTS	70%-76%
D	268-312 POINTS	60%-69%
F	000-267 POINTS	0%-59%

The unavoidable consequence is that some students will be “just a point” away from the next higher or lower grade. For reasons of fairness, the policy in this course is to **NOT** adjust individual grades in such circumstances.

NOTE: Each student's letter grade will be based **EXCLUSIVELY** on the midterm examinations, homework and/or quizzes and the 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 several 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.

ADDITIONAL HELP at Penn State's Counseling & Psychological Services: Students with a need or interest in obtaining counseling services may wish to contact the Penn State Counseling & Psychological Services Office. More information about the Counseling & Psychological Services Office can be found here: http://studentaffairs.psu.edu/counseling/

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.

In order to ensure all students have a fair and equal opportunity to succeed in this course, the Mathematics Department is committed to enforcing the University’s academic integrity policy. Below is a description of academic misconduct and the department’s responsibilities when misconduct is suspected.

Academic Misconduct

In this course, academic misconduct includes, but is not limited to:

- Copying the work of another student on an exam, quiz, or assignment;
- Passing off the work of another individual as your own;
- Using non-approved devices or aids on exams, quizzes, or assignments;
- Having unauthorized possession of exams or quizzes;
- Engaging in deception in order to extend or reschedule an exam, quiz, or assignment;
- Facilitating acts of academic misconduct by others.

When Academic Misconduct is Suspected

If a student is suspected of academic misconduct, the instructor's duties are to:

- Confidentially inform the student of the allegation;
- Enter the charge and recommended sanctions on an Eberly College of Science Academic Integrity form;
- Ask the student to meet in order to review the form and discuss the charges and sanctions. The student can choose to accept or contest the allegation at this point.

Note that a student's refusal to meet with the instructor or respond to the charges within a reasonable period of time is construed as acceptance of the allegation and proposed sanctions.

Once the Academic Integrity form has been accepted or contested by the student, it is sent to the College's Academic Integrity Committee for adjudication. A student cannot drop or withdraw from the course during the adjudication process.

Sanctions

If a student accepts an academic misconduct allegation, or if (s)he is found guilty during adjudication, probable sanctions include:

- A warning and
- Reduction of the assignment grade to zero or
- Reduction of the quiz or exam grade to zero.

Additional sanctions might include:

- Reduction in the final course grade;
- An F in the course.

In addition, the student will be unable to drop or withdraw from the course.

Please see the Eberly College of Science Academic Integrity homepage for additional information and procedures.

STUDENTS WITH DISABILITIES: Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact Student Disability Resources at 814-863-1807 (V/TTY). For further information, please visit Student Disability Resources web site: . http://equity.psu.edu/student-disability-resources/ .

In order to receive consideration for accommodations, you must contact SDR and provide documentation (see the documentation guidelines at http://equity.psu.edu/student-disability-resources/). If the documentation supports your request for reasonable accommodations, SDR will provide you with an accommodation letter identifying appropriate academic adjustments. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

CODE OF MUTUAL RESPECT AND COOPERATION: **The Eberly College of Science Code of Mutual Respect and Cooperation pertains to all members of the college community; faculty, staff, and students.** The Code of Mutual Respect and Cooperation was developed to embody the values that we hope our faculty, staff, and students possess, consistent with the aspirational goals expressed in the Penn State Principles. The University is strongly committed to freedom of expression, and consequently, the Code does not constitute University or College policy, and is not intended to interfere in any way with an individual's academic or personal freedoms. We hope, however, that individuals will voluntarily endorse the 12 principles set forth in the Code, thereby helping us make the Eberly College of Science a place where every individual feels respected and valued, as well as challenged and rewarded.

EDUCATIONAL EQUITY: The Office of the Vice Provost for Educational Equity serves as a catalyst and advocate for Penn State's diversity and inclusion initiatives. Educational Equity's vision is a Penn State community that is an inclusive and welcoming environment for all. If you wish to learn more or if you wish to report bias, please visit the Educational Equity website.

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. C.J. Parsons, Senior Lecturer and Scientific Calculus Coordinator
104 McAllister Building
University Park, PA 16802
Telephone: 814-865-7528
E-mail: cjp@psu.edu

Include your Name, Student ID, Course, and Section Number in any correspondence and always use your @psu.edu email address.

SUGGESTED LECTURE SCHEDULE for MATH 140

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
1	Monday	Aug 21	Introduction	Tangent & Velocity Problems	CLASS BEGINS
	Tuesday	Aug 22	1.4	Tangent & Velocity Problems	
	Wednesday	Aug 23	1.5	Limit of a Function	
	Thursday	Aug 24			
	Friday	Aug 25	1.6	Calculating Limits; Limit Laws	
	Saturday	Aug 26			DROP ENDS 11:59pm
	Sunday	Aug 27			ADD ENDS 11:59pm
2	Monday	Aug 28	1.6	Calculating Limits; Limit Laws	
	Tuesday	Aug 29	1.8	Continuity	
	Wednesday	Aug 30	1.8	Continuity	
	Thursday	Aug 31			
	Friday	Sept 1	2.1	Derivatives and Rates of Change	
3	Monday	Sept 4		NO CLASSES	LABOR DAY
	Tuesday	Sept 5	2.2	Derivative as a Function	
	Wednesday	Sept 6	2.2	Derivative as a Function	
	Thursday	Sept 7			
	Friday	Sept 8	2.3	Differentiation Formulas	
4	Monday	Sept 11	2.3	Differentiation Formulas	
	Tuesday	Sept 12	Trig	Brief Trig Review	
	Wednesday	Sept 13	2.4	Derivatives of Trig Functions	
	Thursday	Sept 14			
	Friday	Sept 15	2.4	Derivatives of Trig Functions	
5	Monday	Sept 18	2.5	Chain Rule	
	Tuesday	Sept 19	2.5	Chain Rule	
	Wednesday	Sept 20	2.6	Implicit Differentiation	
	Thursday	Sept 21			
	Friday	Sept 22	2.6	Implicit Differentiation	
6	Monday	Sept 25	2.7	Rates of Change in Nat and Soc Sciences	
	Tuesday	Sept 26	2.8	Related Rates	
	Wednesday	Sept 27	2.8	Related Rates	
	Thursday	Sept 28			
	Friday	Sept 29	2.8/Review	Related Rates/Review	

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
7	**Monday**	**Oct 2**	**Review**	**Review**	**EXAM 1**
	Tuesday	Oct 3	2.9	Linear Approx & Differentials	
	Wednesday	Oct 4	2.9	Linear Approx & Differentials	
	Thursday	Oct 5			
	Friday	Oct 6	3.1	Maximum & Minimum Values	
8	Monday	Oct 9	3.1	Maximum & Minimum Values	
	Tuesday	Oct 10	3.2	The Mean Value Theorem	
	Wednesday	Oct 11	3.3	Derivatives and Graphs	
	Thursday	Oct 12			
	Friday	Oct 13	3.3	Derivatives and Graphs	
9	Monday	Oct 16	3.4	Limits at Infinity; Horizontal Asymptotes	
	Tuesday	Oct 17	3.4-3.5	HA, Curve Sketching	
	Wednesday	Oct 18	3.5	Curve Sketching	
	Thursday	Oct 19			
	Friday	Oct 20	3.5	Curve Sketching	
10	Monday	Oct 23	3.7	Optimization Problems	
	Tuesday	Oct 24	3.7	Optimization Problems	
	Wednesday	Oct 25	3.7	Optimization Problems	
	Thursday	Oct 26			
	Friday	Oct 27	3.9	Antiderivatives	
11	Monday	Oct 30	Review	Review	
	Tuesday	**Oct 31**	**Review**	**Review**	**EXAM 2**
	Wednesday	Nov 1	4.1	Areas	
	Thursday	Nov 2			
	Friday	Nov 3	4.1	Areas	
12	Monday	Nov 6	4.2	The Definite Integral	
	Tuesday	Nov 7	4.3	Fundamental Theorem of Calculus	
	Wednesday	Nov 8	4.3	Fundamental Theorem of Calculus	
	Thursday	Nov 9			
	Friday	Nov 10	4.4	Indefinite Integrals	LATE DROP DEADLINE

WEEK	DAY	DATE	SECTION(S)	TOPIC	COMMENTS
13	Monday	Nov 13	4.5	Substitution Rule	
	Tuesday	Nov 14	4.5	Substitution Rule	
	Wednesday	Nov 15	5.1	Area between Curves	
	Thursday	Nov 16			
	Friday	Nov 17	5.1	Area between Curves	
14	Monday	Nov 20			THANKSGIVING BREAK
	Tuesday	Nov 21			THANKSGIVING BREAK
	Wednesday	Nov 22			THANKSGIVING BREAK
	Thursday	Nov 23			THANKSGIVING BREAK
	Friday	Nov 24			THANKSGIVING BREAK
15	Monday	Nov 27	5.2	Volumes	
	Tuesday	Nov 28	5.2	Volumes	
	Wednesday	Nov 29	5.3	Volumes by Cylindrical Shells	
	Thursday	Nov 30			
	Friday	Dec 1	5.3	Volumes by Cylindrical Shells	
16	Monday	Dec 4	Ch 5	Areas & Volumes – mixed practice	
	Tuesday	Dec 5	Review Ch 4	Integrals	
	Wednesday	Dec 6	Review Ch 3	Graphing, Optimization	
	Thursday	Dec 7			
	Friday	Dec 8	Review, Ch. 1-2	Limits, Derivatives	CLASS ENDS