Course Syllabus

Penn State University - University Park, Online

MATH 140, Calculus with Analytic Geometry I

GENERAL DESCRIPTION:

> MATH 140 is the first course in a two- or three-course calculus sequence for students in science, engineering and related fields.
> Calculus is an important building block in the education of any professional who uses quantitative analysis. This course introduces and develops the mathematical skills required for analyzing change and creating mathematical models that replicate real-life phenomena. The goals of our calculus courses include to develop the students' knowledge of calculus techniques and to use the calculus environment to develop critical thinking and problem solving skills.

CATALOG DESCRIPTION: MATH 140

> (GQ) CALCULUS WITH ANALTYIC GEOMETRY 1 (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:

> Students enrolling in MATH 140 must have demonstrated proficiency in pre-calculus mathematics, by 1) a satisfactory score on the math proficiency/placement exam, or 2) satisfactory completion of MATH 022 (College Algebra II) AND MATH 026 (Trigonometry),or 3) satisfactory completion of MATH 041 (College Algebra and Trigonometry).

TEXT:

> Required Materials:
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> **1. Textbook:Calculus: Early Trancendentals by Jon Rogawski, Colin Adams, and Robert Franzosat. 4thed. 2019. MacMillan.**
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> 2. Online:
>
> An activated Achieve account.
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> Options for Purchasing the Required Materials:

The required materials are available in three different forms (you need to purchase only one):

- Electronic Package: isbn9781319371883. This option provides access to the ebook version of the course materials through a single Achieve account.
- Print Package: isbn 9781319371869 This option includes a hardback edition of the textbook and access to the ebook. Note: The print option includes an activation code for the ebook as well, so anyone who purchases the print option will also have access to the ebook version through their Achieve account.
- Loose-Leaf Package: isbn 9781319371845. This option includes a printed loose-leaf edition of the textbook and access to the ebook.

Note: As with the Print option he loose-leaf option includes an activation code for the ebook as well, so anyone who purchases the loose-leaf option will also have access to the ebook version through their Achieve account.

Where to Purchase the Required Materials:

- Electronic: Directly through Achieve. To purchase, you will need the Course ID provided to you on the first day of class, which you can you then enter on the Achieve Website.
- Print & Loose-Leaf:

(i) Directly through Achieve. (As with the Electronic Option, you will need the Course ID provided to you on the first day of class.)

(ii) The Penn State University Bookstore.

An Important Note:

Please do not purchase or rent any edition of the textbook through any source not listed above. Currently, only the publisher and the University Bookstore offers the edition of the textbook used in this class. Please check with your instructor before buying or renting through another source.

COURSE FORMAT:

This course is an online offering. Each week, short lecture videos will be available to watch and live sessions will be scheduled; these live sessions will be recorded. Additionally, homework (online and in text) will be available. Assessment will occur via weekly online quizzes, two midterm exams, and a comprehensive final exam. See **Student Responsibilities** for additional expectations.

LEARNING OBJECTIVES

Upon successful completion, a student should be able to:

1. Use linear, exponential, and sinusoidal functions, as well as transformations, compositions, inverses, and piecewise combinations thereof to model real-world scenarios.

2. Calculate or estimate limits of functions given by formulas, graphs, or tables.

3. Determine whether a function given by a graph or formula is continuous at a given point or on a giveninterval or on its domain.

4. Determine whether a function given by a graph or formula is differentiable at a given point or on a giveninterval.

5. Distinguish between the average and instantaneous rate of change and interpret the definition of the derivative graphically.

6. Determine derivatives of some functions using the limit definition of the derivative.

7. Calculate derivatives of polynomial, rational, and common transcendental functions, and combinations ofthese functions.

8. Calculate derivatives of composite functions.

9. Calculate derivatives of implicitly defined functions and inverse functions.

10. Give examples to illustrate important theorems.(Intermediate Value Thm, Rolle's Thm, Mean Value Thm, Extreme Value Thm, Squeeze Thm)

11. Apply the ideas and techniques of derivatives to related rate problems.

12. Apply the ideas and techniques of derivatives to finding local and absolute extrema.

13. Apply the ideas and techniques of derivatives to graphing functions.

14. Apply the ideas and techniques of derivatives to optimization problems.

15. Find linear approximations of functions (differentials).

16. Calculate the Riemann sum for a given function and partition.

17. Describe a definite integral as the limit of a Riemann sum.

18. Determine the antiderivatives of some algebraic functions and transcendental functions.

19. Calculate values of definite integrals using antiderivatives and areas.

20. Use the Fundamental Theorem of Calculus to determine the derivative of an integral.

21. Use the Fundamental Theorem of Calculus to evaluate definite integrals.

22. Use the Net Change Theorem to solve accumulation problems.

23. Determine the units and give the practical interpretation of derivatives and definite integrals.

24. Synthesize concepts from two or more separate sections of the text.

This course satisfies the General Education learning objectives Key Literacies and Critical and Analytical Thinking.

CALCULATORS:

A graphics calculator/plotting program/computation platform 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. Therefore, **NO calculators are allowed on exams**.

EXAMINATIONS:

There will be two 90-minute midterms during the semester and a comprehensive two-hour final exam will be given at the end of the semester. **All exams are proctored by HonorLock.**

The proctoring software will use your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, and viewing you and your surroundings. By enrolling in this course, you consent to the use of the proctoring software, including but not limited to any audio and/or visual monitoring which may be recorded.

Exam Windows

When using HonorLock, you can take the exam anytime during the exam window.

Each exam follows the same protocols.

1. Exams are multiple choice, graded solely on a right/wrong scale. Exams include both computation and conceptual questions.
2. You will be given 90 minutes to complete the midterm exam, and 120 minutes to complete the final exam.

STUDENT RESPONSIBILITIES

As a student enrolled in this course your responsibilities include the following:

- Abide by Penn State’s policies on Academic Integrity.
- Complete assignments on time and keep pace with the course.

> - Devote sufficient time and diligent effort to completing course work.
>   (The recommended investment is **10–12 hours a week**, and more if you need to review algebra concepts).
> - Contribute to the discussion forum, both by asking questions about concepts you struggle with and by answering questions asked by others.
> - Participate in the recitation sessions and/or submit questions for recitation and view the recording.
> - Actively participate by seeking help and asking questions for clarifying concepts you do not fully understand.
> - Use the quiz feedback and activity solutions to understand where you have the greatest difficulties and follow up on resolving these.

COURSE MECHANICS:

- **Homework.** The text will be primarily used to tie ideas to concepts and skills together. This will be done through assigned readings and suggested problems. Some activities will stem directly from the text.
- **Achieve Homework** (**graded**) assignment will be done and evaluated online via Achieve. Access code required for this online class.
- **Written Homework (graded)** assignments will be done and evaluate via submitted work on Canvas.
- **Assessments.** All quizzes and exams will be administered online via the CANVAS course management system.
- Weekly Canvas Quizzes will be done and evaluated online via Canvas.
- **The two midterm exams and the final comprehensive exam are proctored exams. The HonorLock is the proctoring platform.**
- **Live Session.** ZOOM will be used for live sessions.
- **Discussion Forum.** CANVAS will be the primary vehicle for discussions. The Canvas Discussions tool should NOT be reserved for questions that are of a private nature, including specific questions about problems on quizzes, tests, and exams prior to their due date.
- **Communication.** The **CANVAS EMAIL** system should be used for direct **communication** with your instructor. As per PSU policy, you should expect to wait for a reply to an email 24 - 48 hours. CANVAS discussion Forum should be used for posting general questions (the type of which you might ask in a live classroom).
- **NO LATE ASSIGNMENTS ARE ACCEPTED. NO EXTENSION GRANTED.**

COURSE GRADES:

COURSE GRADES: Grades will be assigned on the basis of 700 points, distributed as follows:

Examination I	100
Examination II	100

Homework/Quizzes/Discussion	300
Final Examination	200
TOTAL	**700**

Your grade will be based **EXCLUSIVELY** on the midterm examinations, homework and/or quizzes and final examination.

Final course grades will be assigned as follows:

	Percent Score
A	93% - 100%
A-	90% - 92%
B+	87% - 89%
B	84% - 86%
B-	80% - 83%
C+	77% - 79%
C	70% - 76%
D	60% - 69%
F	0% - 59%

DEFERRED GRADES:

> Students who are currently passing a course but are unable to complete the course due to illness or emergency may be granted a deferred grade which will allow the student to complete the course within ten weeks of the last day of classes. 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 (http://handbook.psu.edu/content/deferred-grade)** .

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 no 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.
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> Based upon the University's **Faculty Senate Policy 49–20 (http://www.psu.edu/ufs/policies/47-00.html#49-20)** , a range of academic sanctions may be taken against a student who engages in academic dishonesty. Please refer to the **Eberly College of Science Academic Integrity Policy page (http://science.psu.edu/current-students/Integrity/Policy.html)** for additional information about the process and procedures.

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.

According to Penn State policy ***G-9: Academic Integrity*** **(https://undergrad.psu.edu/aappm/G-9-academic-integrity.html)** *, an academic integrity violation is "an intentional, unintentional, or attempted violation of course or assessment policies to gain an academic advantage or to advantage or disadvantage another student academically." Unless your instructor tells you otherwise, you must complete all course work entirely on your own, using only sources that have been permitted by your instructor, and you may not assist other students with papers, quizzes, exams, or other assessments. If your instructor allows you to use ideas, images, or word phrases created by another person (e.g., from Course Hero or Chegg) or by generative technology, such as ChatGPT, you must identify their source. You may not submit false or fabricated information, use the same academic work for credit in multiple courses, or share instructional content. Students with questions about academic integrity should ask their instructor* ***before submitting work****.*

Students facing allegations of academic misconduct may not drop/withdraw from the affected course *unless they are cleared of wrongdoing (see* ***G-9: Academic Integrity*** **(https://undergrad.psu.edu/aappm/G-9-academic-integrity.html)** *). Attempted drops will be prevented or reversed, and students will be expected to complete course work and meet course deadlines. Students who are found responsible for academic integrity violations face academic outcomes, which can be severe, and put themselves at jeopardy for other outcomes which may include ineligibility for Dean's List,*

pass/fail elections, and grade forgiveness. Students may also face consequences from their home/major program and/or The Schreyer Honors College.

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.

COUNSELING AND PSYCHOLOGICAL SERVICES: Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screen- ings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation.

CAPS CONTACT INFORMATION:

Counseling and Psychological Services at University Park (CAPS): 814-863-0395
http://studentaffairs.psu.edu/counseling/

Penn State Crisis Line (24 hours/7 days/week): 877-229-6400

Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

QUESTIONS, PROBLEMS, OR COMMENTS

If you have questions or concerns about the course, please consult your instructor first.
Kasha Przybyla
Email: **kep11@psu.edu (mailto:kep11@psu.edu)**

If further guidance is needed, you may contact the Director of Online Instruction, Department of Mathematics:
Dr. Stan Smith
Telephone: 814–865–7528
Email: sss26@psu.edu
Please Include your Name, Student ID, Course and Section Number in any correspondence.

COURSE STRUCTURE

There are 16 weeks in the course, two midterm exams, and a final exam. There will be 12 Lessons "instruction" weeks, encompassing approximately three/four sections from the textbook, two "midterm" weeks, and time for the final exam. The 12 weeks will have the following components:

- Suggested readings in the text.
- Live sessions/recitations (recorded for later viewing).
- Achieve Homework Problems.
- Canvas Homework Problems.
- Canvas Discussion
- Canvas Weekly Concept Quiz.

COMPONENTS DETAILS (a typical "instruction" week):

- **Suggested Reading and Problems from the text.**
  A reading and suggested homework assignment will be made every week.
- **Live Sessions/Recitation.**
  Each week (Tuesdays and/or Wednesdays) there will be live sessions/recitations. These sessions will be used to discuss the main concepts for the week. These sessions will also provide an opportunity for you to get more in-depth feedback about particular problems, review more extensive examples, and ask some questions. These sessions will be recorded for those who are not able to attend. However, the content of the recitation will depend on your questions and/or the points of difficulty in the week's lesson. If you are not able to attend the live lecture, you may still submit questions via the discussion forum on Canvas.
- **Guided Study Groups** - Live in the classroom.
  There will be regular guided study group sessions with a Penn State Learning Center tutor to go over specific problems.
- **Canvas Board - Discussion (graded)**
  The Canvas board will be used extensively in this course. This is the place to post questions, answer other students' questions to prepare you for the concept quizzes etc...
- **Achieve Homework Problems (graded)**
  You will be expected to complete a weekly skills-based Homework Set, consisting of approximately 10 - 15 problems in Achieve. Working through the problems and questions will help master the course concepts and prepare you for weekly quizzes and exams.
- **Canvas Written Homework Problems (graded)**
  You will be expected to complete weekly open-ended written homework assignments by scanning and submitting your full work in the designated place on Canvas. Working through the problems and questions will help master the course concepts and prepare you for weekly quizzes and exams. T**here will be 12 written homework assignments in the semester and the best ten will count towards the final grade (the lowest two will be dropped).**
- **Canvas Weekly Concept Quiz (graded).**
- Each week will have a problem and concept quiz. It will be available Monday and due the following Monday. This quiz will typically consist of approximately 5 to 8 questions. You will have **two attempts** on this quiz. **There will be 12 quizzes in the semester and the best ten will**

count towards the final grade (the lowest two will be dropped). You will want to make sure you have read through the weekly lesson activity, completed the practice questions, completed the homework questions, and participated on Discussion before accessing this quiz.

Your Final Grade will be based **EXCLUSIVELY** on the midterm examinations, homework and quizzes, and final examination. No late work is accepted. There is no additional (to the existing one) "extra-credit" work.

COURSE GRADES:

Grades will be assigned based on 700 points, distributed as follows:

Components	Points
Achieve Homework (total 100 pts)	**100**
Written Homework (total 100 pts)	**100**
Canvas Weekly Quizzes (total 80 pts)	**80**
Canvas Discussion	**20**
Practice Exams (5 pts each), 15pts extra credit	**0**
Midterm Exams (100 points each)	**200**
Final Exam (200 points)	**200**
TOTAL	**700**