

MAT181– Applied Calculus (Spring 2022) Course Syllabus

Instructor

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Office Hours: 12 – 2 pm on MW and 9 – 9:30 am on TR

Office: MCT 278



Important Sites

D2L <https://d2l.ship.edu>

Mylab <https://www.pearson.com/mylab>

Zoom Office Hours <https://ship.zoom.us/j/94338091000>

Course Materials

D2L provides key lecture videos and notes, and you will submit your class activities and check your grades.

Mylab (Course ID: **choi91412**) provides problems to work at home (Please find a [registration instruction](#))

Text Book (optional): *Calculus and its applications, 12th edition*, by Bittinger, Ellenbogen, Surgent, from Pearson & Prentice Hal Publishing

Catalog description: This is designed for students in the College of Business, and covers differentiation and integration of functions of a single variable with applications including graphing and simple optimization. *Prerequisite: Grade of C or better in MAT 140 or advanced level placement. Course not open to students who have successfully (C or better) completed MAT211.*

Tentative Schedule

Exam 1: Monday of February 21

Exam 2: Thursday of April 4

Final: To be announced (It will be on the final week 5/2-5/6 and cumulative)

Grading

Your grade will be based on your notes, homework, quizzes, and a cumulative Final. There would be an extra credit for your participation in Discussion Board forums. I will use the following grading scheme:

Class Activities	10%	Notes (72%) + Attendance (28%)
Mylab Work	30%	Homework (70%) + Quizzes (30%)
Exams	60%	Exam1 (30%) + Exam 2 (30%) + Final (40%)

At the end of the course, I will assign grades based on the following scale:

Percentage	90 -100	87-89	84-86	80-83	77-79	74-76	70-73	60-69	0-59
Final Grade	A	A-	B+	B	B-	C+	C	D	F

Expectations

In class, you will learn new ideas and work on problems to master the ideas. If you have any questions, please do not hesitate to ask in class or in my office hours. Each week, you will **submit 1 pdf file for your class activities to d2l**, unless you are asked not to. (I recommend Adobe Scan or Genius Scan app to take a picture of your work, save it as one single pdf file, and then upload it in d2l. The instruction is available below.)

If you miss any class, you will **watch the videos and notes in d2l and contact me** immediately to find extra information. You can email me, come to my office, or request a zoom meeting.

Online Homework and Quizzes: You will do homework and take quizzes in Mylab. Each quiz will be available only if the associated homework score is 70% or higher. **You can redo homework** assignments as many times as you want **before the deadline**. However, you have only **two chances for each quiz** problem and you have **time limit** to complete each set of quiz problems.

Scan App Information

Adobe Scan app

- Android link:
https://play.google.com/store/apps/details?id=com.adobe.scan.android&hl=en_US
- Apple link: <https://apps.apple.com/us/app/adobe-scan-digital-pdf-scanner/id1199564834>
- Video tutorial: <https://www.youtube.com/watch?v=MCyhOkBpELc>

Genius Scan app

- Android link:
https://play.google.com/store/apps/details?id=com.thegrizzlylabs.geniusscan.free&hl=en_US
- Apple link: <https://apps.apple.com/us/app/genius-scan-pdf-scanner/id377672876>
- Video tutorial: <https://www.youtube.com/watch?v=PAmUKvvUjgs>

Student Learning Outcomes:

- Be able to explain information presented in mathematical forms (e.g. equations, graphs, diagrams, tables, and words). (SLO Q1: Interpretation)
- Be able to perform calculations and draw appropriate conclusions based on them. (SLO Q2: Analysis)
- Be able to express quantitative evidence in support of an argument. (SLO Q3: Communication)

Tutoring

- Free walk-in Math Department Tutoring at MCT252(?) and DHC104(?)
- Free but appointment-required Learning Center Tutoring at Mowrey

Tentative Course Calendar (Spring2022)

Adjustments and updates to the course schedule, due to inclement weather or other unforeseen events, will be announced in class.

Wk	Section and Topic	STUDENT LEARNING OBJECTIVES - TSWBT (the student will be able to):	Assignments
1	Introduction 1.3 Average Rates of Change 1.4 Definition of Derivatives, Graphical and Numerical derivatives, intro	<ul style="list-style-type: none"> (Review) The last gateway exam in MAT140 (Review) Find the slope and the y-intercept to find a linear function (Review) Use function notation and evaluate functions Find the average rate of change (polynomial, with degree no higher than 3) algebraically, numerically, and graphically. Interpret the average rate of change for a given application. (Review) Graph linear functions, including restricting quadrants Find an approximation of derivative by looking at a graph or table. Refer to the instant rate of change, slope of tangent line, or a marginal function as derivative Find the instantaneous rate of change: algebraically, numerically, and graphically 	Register for MyMathLab Weekly 1 pdf Submission to d2l; HW & Quizzes in mylab
2	1.5 Power Rule and Sum-Difference Rules	<ul style="list-style-type: none"> (Review) Use exponent rules (Review) Simplify rational expressions Find the derivative for polynomials Find the marginal revenue/cost/profit given total revenue/cost/profit Find the slope and an equation of a tangent line 	
3	1.6 Product and Quotient Rules 1.7 The Chain Rule	<ul style="list-style-type: none"> Find the derivative of a product or quotient of two functions Apply the chain rule to find the derivative of a function formed in $f(g(x))$. 	Check out your Really-Early-Warning grade based on your HW and quizzes.
4	1.8 Higher-Order Derivatives 2.236 The Derivatives of a^x and $\log_a x$	<ul style="list-style-type: none"> Find the second derivative of a function Find the derivatives & anti-derivatives of a^x and $\log_a x$ Apply the chain rule to find the derivative of $e^{g(x)}$ and $\ln(g(x))$ 	
5	4.1 Antiderivatives	<ul style="list-style-type: none"> Find anti-derivatives of polynomial functions Describe the meaning of the derivatives: slope, margin, rate of change Review for the exam 1 	Exam 1 – Monday 2/21
6	3.1 Using 1 st Derivatives to find Max/Min values	<ul style="list-style-type: none"> (Review) Use interval notation (Review) Solving quadratics Identify whether a function is increasing or decreasing using the derivative Find the critical values and critical points for a function and evaluate the function at that point Find the relative maximum or minimum values of a function 	
7	3.2 Using 2 nd Derivatives to find Max/Min values	<ul style="list-style-type: none"> Continue 3.1 Identify whether a function or a graph is concave up or down 	
8	3.4 Absolute Max/Min 3.5 Max-Min Applications	<ul style="list-style-type: none"> Find the maximum or minimum of a function using the derivatives Find the maximum or minimum values of Revenue, Profit, Cost in application problems 	
9	6.1 Functions of several variables 6.2 Partial derivatives	<ul style="list-style-type: none"> Evaluate multivariate functions Find partial derivatives of a multivariate function (Review) Solve a system of linear equations: finding an intersection of two lines algebraically and graphically 	
10	6.3 maximum- minimum Problems of two variables	<ul style="list-style-type: none"> Find the relative minimum or the relative maximum of a function of several values using D-test Review for the exam 2 	
11	4.1 Antiderivatives	<ul style="list-style-type: none"> Exam 2 Find the most general antiderivative of polynomial and exponential functions Find the total revenue/profit/cost function given marginal revenue/profit/cost. 	Exam 2 – Monday 4/4
12	4.2 Antiderivatives as areas	<ul style="list-style-type: none"> (Review) Find the area of a rectangle and a triangle Approximate the value of a definite integral Represent a definite integral as an accumulation of small amounts (not just area, but revenue/cost/profit) 	
13	4.3 Area and definite integrals	<ul style="list-style-type: none"> Use the Fundamental Theorem of Calculus to evaluate definite integrals. 	
14	Review	<ul style="list-style-type: none"> Review for the final exam 	
15	Final	<ul style="list-style-type: none"> Final exam is a cumulative exam. The date will be announced later. 	Final Exam

University Policies

COVID Risk Mitigation: Students must wear a face mask at all times in class and in the campus classroom buildings. More information about individual's responsibility to protect the health and well-being of the entire campus community can be found on Shippensburg University's website.

Title IX: Shippensburg University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the 2020 regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator at title9@ship.edu or by calling 717.477.1161.

The **only exceptions** to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during: 1. a classroom discussion; 2. in a writing assignment for a class; 3. or as part of a University-approved research project. Faculty members are **obligated** to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy found at [Equity, Inclusion and Compliance](#).

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the following [Equity, Inclusion and Compliance](#).

Academic Dishonesty and Plagiarism: All assignments are expected to be of high quality work and original for each student. *Identification of sources is necessary* when information or documents are from a published source. *Failure to provide authentic work will result in failure of the assignment and/or course.* Please refer to the University's Academic Dishonesty Policy at [Student Conduct](#) and Provost levels as part of shared governance structures coordinated by faculty, staff and administration.

Accessibility Resources: Shippensburg University is committed to providing equal opportunity for participation in all programs, services and activities. The University welcomes all students with disabilities into all of the University's educational programs and strives to make all learning experiences as accessible as possible. Any student who feels they may need an accommodation based on the impact of a disability should contact the Office of Accessibility Resources (OAR) to discuss specific needs. OAR is located in Mowery Hall 252 and can be reached by phone at (717) 477-1364 or via email at oar@ship.edu.

Campus Access and Use of Technology: Students have access to state of the art digital and computer technologies, including hardware and software for all campus related experiences. Students also have access to troubleshooting services located in the Ezra Lehman Library and via the SU Helpdesk at suhelpdesk@ship.edu. Information relating to SU Technology can be found at: [technology](#) and [student help desk](#).

All users of the computing/information network facilities must act responsibly and maintain the integrity of these resources. The University reserves the right to limit, restrict, or extend computing/information network privileges and access to its resources. Information related to this policy can be found at: [network usage](#).