

Time and venue: Section 502: MWF 1:50 – 2:40 p.m. in ARCB 101
Section 504: MWF 3:00 – 3:50 p.m. in MPHY 203

Web page: <http://math.tamu.edu/~mvorobet/MATH142/F14>

Office: BLOC 223A

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Office hours: MWF 11:30 a.m. – 1:00 p.m., or by appointment

BMTAs: Each of my classes will have a business math tutorial assistant. These BMTAs will be offering additional help at times outside of my office hours and other departmentally provided help hours. Times and places for these additional hours of help will be posted on our course webpage and will be announced in class, once they are determined.

Course Title and Description: Business Math II (3 Credit Hours) - Derivatives, curve sketching and optimization, techniques of derivatives, logarithms and exponential functions with applications, integrals, techniques and applications of integrals, multivariable calculus. **Prerequisite** is high school algebra I and II and geometry or satisfactory performance on a qualifying examination. Credit will not be given for more than one of MATH 131, 142, 147, 151 and 171.

Learning outcomes: This course is focused on quantitative literacy in mathematics found in both business and everyday life. Upon successful completion of this course, students will be able to:

- Logically formulate mathematical variables and equations to quantitatively create mathematical models representing problems in everyday life, as well as business, so that calculus can be applied to achieve an optimal solution.
- Quantitatively analyze business concepts such as market equilibrium and break-even analysis.
- Demonstrate knowledge of basic functions, including exponentials and logarithms, to solve financial investment problems.
- Identify patterns in numeric data to calculate limits and derivatives of functions numerically.
- Justify whether a function is continuous or not using the mathematical definition of continuity.
- Understand the derivative as a rate of change in order to quantitatively apply it to everyday life as well as business applications such as marginal analysis and elasticity of demand.
- Investigate the relationship between a function and its first and second derivatives, and use the information obtained from its derivatives to identify pertinent information about the function.
- Apply the definite integral to quantitatively determine solutions to problems in everyday life and business such as area between curves, average value of a function, and producers' and consumers' surplus.
- Recognize and appreciate the relationship between the derivative (rate of change) and the definite integral (accumulation of change), and utilize the Fundamental Theorem of Calculus as the bridge between the two.
- Generalize and extend the pattern of various calculus techniques to functions of two variables in order to find solutions to both everyday and business problems such as marginal productivity of labor and capital.

Core Objectives:

Critical Thinking:

- Students will analyze a function and justify whether or not it is continuous using the definition of continuity.
- Students will use inquiry to determine the best method for taking derivatives of complicated functions.
- Students will identify and categorize information about a function in order to construct a graph of its derivative.
- Students will apply calculus to find innovative ways to graph complicated functions without the aid of technology.

- Students will analyze and synthesize data and think creatively to develop mathematical models for optimization purposes.
- Students will examine how the Fundamental Theorem of Calculus connects differential and integral calculus.

Communication Skills:

- Students will symbolically relay mathematical information and concepts by creating variables and writing equations.
- Students will recognize, construct, and interpret graphs of basic functions.
- Students will write mathematical information symbolically to describe the behavior of functions.
- Students will justify results that use mathematical definitions such as the definition of continuity by writing proofs.
- Students will explain verbally in class the connection between derivatives, rates of change, and slopes of tangent lines.
- Students will develop sketches of the graphs of complicated functions by analyzing their first and second derivatives.
- Students will explain (both in writing and verbally) mathematical solutions to problems.
- Students will be required to answer questions during lecture concerning topics discussed in class.

Empirical and Quantitative Skills:

- Students will evaluate limits numerically and use the information to draw conclusions about the behavior of a function.
- Students will calculate a derivative numerically and explain the result in the context of the problem.
- Students will use marginal analysis to make informed and quantitative business decisions.
- Students will manipulate empirical data to develop a mathematical model to use in an optimization problem, such as maximizing revenue or minimizing cost, and then apply calculus to find and interpret the optimal solution.
- Students will apply the Fundamental Theorem of Calculus to quantitatively compute the accumulated change of a quantity.

Text: Calculus: Applications and Technology, 3rd Ed. by Tomastik

You paid for an electronic book version of the text when you registered for this course. Information on how to access your ebook can be found under the Student Information Page at

<http://www.math.tamu.edu/courses/eHomework/>. Look under the Math 142 link. If you would like a hard bound or loose-leaf copy of the textbook you may buy one, but it is not required.

Calculator Policy: This course requires that you have a TI-83 or TI-84 (Plus or Silver edition) calculator or the TI-Nspire (non-CAS version with an 84 faceplate). No programs are allowed except ones that I give you (if any), and no other types of calculators can be used on quizzes or exams. No sharing of calculators is allowed on quizzes or exams. Memory **MUST** be reset before every exam. To enter the class on exam days, your calculator must be on and say MEM CLEARED, and you must have a photo ID (TAMU ID card or Drivers License).

Course Web Page: The course web page will be my main source of communication to you aside from class and office hours. Check the course page regularly for announcements, exam information and the course schedule.

Email Policy: Check your official TAMU email account EVERY day. You are responsible for any information I send via email. Because of the privacy rights, I cannot discuss grades via email or over the phone. Please include your full name and section number in your email.

Online Homework: Homework will be assigned online on the Webassign system for each section and will be due regularly. Instructions are available at <http://www.math.tamu.edu/courses/eHomework/>

If you ever have technical issues with WebAssign, please fill out a Student Help Request Form found at <http://www.math.tamu.edu/courses/eHomework/trouble.html>

You may use scratch paper, calculators etc. on the online homework. The deadlines are programmed into the computer system, so submitting your homework well before the deadline is recommended. If you submit your homework late, the computer will automatically give you a zero for the assignment and not record your answers. You are responsible for remembering to do the homework.

Suggested Homework: A list of suggested homework problems will be posted on the course web page. These problems will not be collected for a grade. You are strongly recommended to do all of them which will provide valuable practice for the quizzes and exams.

Cell Phone Policy: Have cell phones OFF at all times in my classroom. Texting during class is not allowed.

Quizzes: Quizzes will be given regularly, almost every week (except exam weeks) during the class on Fridays. All of them are mandatory, although, the lowest grade will be dropped at the end of the semester. Make up quizzes will be provided if you have written evidence of an official University excused absence (see *University Student Rules*) AND contact me **NO LATER** than the second working day after the quiz to schedule a make-up quiz (See *University Student Rules*).

Examinations:

The *tentative* midterms dates are: Exam I – Sept. 26, Exam II – Oct. 31, Exam III – Dec. 3.

The *final* exam schedule:

Section 502: Tuesday, December 16 at 3:30 – 5:30 p.m.

Section 504: Tuesday, December 16 at 10:30 a.m. – 12:30 p.m.

No collaboration on the midterms and on the final is allowed. The use of books, cell phones or notes of any sort during exams is not permitted.

Make-up exams: If you have a University approved absence for missing an exam, you will be expected to make up your exam in BLOC 102/BLOC 205 according to the following schedule. Only if you have a University approved absence for the day of the exam and the makeup day will you be allowed to use the later options or have other arrangements made.

- **Exam 1:** 9/29 at 5:45 p.m. in BLOC 102
9/30 at 2:30 p.m. in BLOC 205
- **Exam 2:** 11/3 at 5:45 p.m. in BLOC 102
11/4 at 2:30 p.m. in BLOC 205
- **Exam 3:** 12/4 at 4:00 p.m. in BLOC 102
12/5 at 2:30 in BLOC 205

Grading Policy: Your grade will be determined by online homework, quizzes, three midterms, and a cumulative final exam.

EXAM I = 17%, EXAM II = 17% , EXAM III = 17% , Quizzes = 15%, HW = 10%, FINAL EXAM = 24%.

The final grades will be assigned according to the 90–80–70–60% scale, that is, A for 90 – 100%, B for 80 – 89% , C for 70 – 79%, D for 60 – 69%, and F for 0 – 59%.

Help Sessions and Week-in-Review: The Mathematics Department offers help sessions for Math 142 students. See <http://www.math.tamu.edu/courses/helpsessions.html> for the schedule and more information. Also every week there will be a week-in-review conducted by Mrs. Marcia Drost for all sections of Math 142. Problems will be posted before each session. See <http://www.math.tamu.edu/drost/142wirFALL14c.html> for the week-in-review information and schedule.

Course schedule.

- **Week 1:** A.8: Brief review of basic functions and shifts, 1.0: Complete Graphs, 1.1 topics: Increasing, Decreasing, Concavity, Continuity, and Piecewise-defined Functions, 1.2 topics: Break-even Analysis and Market Equilibrium, Exponential Functions
- **Week 2:** 1.5, 3.1 Logarithmic Functions, Limits and Continuity
- **Week 3:** 3.2, 3.3 Rates of Change, The Derivative
- **Week 4:** Review, Exam I (A.8, 1.0, 1.1 topics, 1.2 topics, 1.3, 1.5, and 3.1-3.3)

- **Week 5:** 4.1, 4.2, 4.3 Simple Derivative Rules and Marginal Analysis, Product and Quotient Rules, Chain Rule
- **Week 6:** 4.4, 4.5, 5.1 Derivatives of Exponential and Logarithmic Functions, Elasticity of Demand, Analyzing Graphs with the First Derivative
- **Week 7:** 5.2, 5.3, 5.4 Analyzing Graphs with the Second Derivative, Limits at Infinity, Curve Sketching Techniques
- **Week 8:** 5.5, 5.6 (Inventory Control is optional) Absolute Extrema, Optimization
- **Week 9:** Review, Exam II (4.1-4.5 and 5.1-5.6)
- **Week 10:** 6.1, 6.2, 6.3 Antiderivatives, Substitution, Riemann Sums and Estimating Distance
- **Week 11:** 6.4, 6.5, 6.6 The Definite Integral, Fundamental Theorem of Calculus and Average Value of a Function, Area Between Curves
- **Week 12:** 6.7, 8.1 Consumers' and Producers' Surplus, Functions of Several Variables.
- **Week 13:** 8.2 Partial Derivatives
- **Week 14:** Review, Exam III (6.1-6.6, 6.7 topic, and 8.1-8.2), 8.3
- **Week 15:** Review for Final Exam
- **Week 16:** Final Examinations

Make-up Policy: No make-ups will be given without written evidence of an official University excused absence (see <http://student-rules.tamu.edu/rule07>). In addition, you must notify me **NO LATER** than the end of the second working day after the missed assignment:

... the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. This notification should include an explanation of why notice could not be sent prior to the class. (Section 7.3 of the *University Student Rules*)

*****If no such notice is given, the rights to a make-up are forfeited.** Specifically, in the case of injury or illness, students are required to obtain a confirmation note from a health care professional affirming date and time of a medical office visit regarding the injury or illness. I will NOT accept the "Explanatory Statement for Absence from Class" form as sufficient written documentation of an excused absence.

Late Work Policy: Late work (for which you do not have a University approved excused absence) will NOT be accepted. This includes all written and online assignments.

Attendance: I STRONGLY suggest that you attend every lecture. Falling behind in this course can be very detrimental to your grade. If you miss lecture, you must have an official University excused absence (with written proof) in order to hand-copy my notes (during office hours).

Scholastic Dishonesty: Copying work done by others, either in-class or out-of-class, is an act of scholastic dishonesty and will be prosecuted to the full extent allowed by University policy. Collaboration on assignments, either in-class or out-of-class, is forbidden unless I grant permission.

If you cheat on an assignment, you will receive a zero. Also, you will be reported to the University. Another form of cheating is typing formulas in the calculator or using programs that give you an advantage over classmates. If I catch anyone cheating this way, you will get a zero on the assignment and be reported to the University for cheating.

Remember the Aggie Code of Honor: "**An Aggie does not lie, cheat, or steal or tolerate those who do.**"

For more information about the Honor Council Rules and Procedures visit the web site:

<http://aggiehonor.tamu.edu>

Copyright notice: All course materials (both printed and web-based) are protected by U.S. Copyright Laws. No multiple copies can be made without written permission by the instructor.

Disability services: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for

reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>