MA 203 Single Variable Calculus – I Fanuchanan (Fall) 2024

Class Meeting: MTWTh 12:30 – 1:45 p.m. in SC 121
Instructor: Zoltan Szekely, Ph.D. Associate Professor of Mathematics
Office: SC 106 **Phone:** 735-2830
Email: zszekely@triton.uog.edu
Office Hours: MTW 3:00 – 5:00 p.m.

Catalogue Course Description:

This is the first semester of a standard calculus course. Topics include limits, continuity; the definition of derivatives; derivatives of algebraic and transcendental functions; product, quotient, and chain rules; applications; and Riemann Sums. Prerequisite: Grade of C or better in MA 161b or MA 165 or placement or equivalent.

Course Content:

This course covers: hyperbolic functions, limit, derivative, differentiation rules, implicit differentiation, applications of differentiation, minimum and maximum values, Mean Value Theorem, l'Hospital's Rule, curve sketching, definite and indefinite integrals, the Fundamental Theorem of Calculus

Rationale for Offering the Course:

This course introduces students to the fundamental ideas of calculus: limits, derivatives and the definite integral. Though not highly stressed, the mathematical foundations of these ideas are provided, so that students receive an introduction to mathematical precision and rigor. Calculus is then used to investigate ideas from physics, such as velocity, acceleration, centers of mass, from geometry, such as areas and volumes, from finance, such as capital formation, and other disciplines. Students thus receive an introduction to mathematical modeling and applied mathematics, that is, how mathematics is used to study the physical world.

Intended Student Learning Outcomes:

Upon successful completion of this course, students will be able to

- demonstrate understanding of limits, continuity, and derivatives of functions,
- use the product, quotient, and chain rules for direct and implicit differentiation,
- find derivatives of polynomial, rational, exponential, logarithmic, trigonometric, and hyperbolic functions,
- use differential calculus in curve sketching and problems-solving,
- find definite and indefinite integrals of a limited number of elementary functions.

Format/Activities in the Class:
This is face-t-face class with a Moodle companion website. Participate at *each class session on time*. Learning mathematics requires that you work and *practice mathematics every day*. Dialogue and cooperative learning are encouraged. You will learn *clear communication* of your ideas. Your instructor is hard of hearing. Please, don't hesitate to ask questions in class. You may also email me any time. A *TI-83*, *TI-84* or equivalent *graphing calculator* will be useful in this class.

Textbook: Calculus, Early Transcendentals by James Stewart, 7E edition. We will cover *Chapters 1-5.*

Assignments, Quizzes, Tests:
You will have to *read the textbook for each class in advance* and review the section. Please, practice a good number of *homework exercises* from the textbook. Please note that all work, quizzes or test you submit must reflect *your own individual efforts*. Keep in mind that the scores (including the overall *semester score*) you earn in this class *will be in direct correlation with the individual effort you invest in studying your subject!*

Please, be ready for 20-25-minute-long *multiple-choice Quizzes* or 15-minute-long paper-and-pencil Quizzes at any time with questions like your homework assignments. You are recommended to *practice both even and odd numbered exercises* from your textbook. There will be a two-part Midterm Exam about halfway through the Session. A preliminary time schedule is listed below. Timing may change depending on the progress we make with the class material. The *Final Exam is cumulative.*

Format of Quizzes and Tests:
Quizzes will have time limitations. Please, complete your Quizzes in the given time limit. Each Quiz can be attempted only once, at the assigned time in class. Exams will have two parts. Part 1 is a multiple-choice Quiz, longer than a regular Quiz. Part 2 consists of open-ended problems to work out paper-and-pencil.

Preliminary Test dates (any change will be announced in class):

- Midterm: Tuesday, October 15th
- The *Final* is at 12:00-13:50 p.m. on Wednesday, December 11th

Evaluation and Grades:

There will be about 12-14 Quizzes, the first collection of 6-7 Quizzes before the Midterm and the second collection of 6-7 more Quizzes after the Midterm. The lowest Quiz will be

dropped from both collections, so overall, *two Quizzes of the lowest scores will be dropped.* There will be an *assessment* of using the Chain Rule for differentiation.

Tentative course calendar:

Week 0-1	*Chapter 1* 1.1: Representing function 1.2: Mathematical models 1.3: New functions from old ones 1.5: Exponential functions 1.6: Inverse functions and log.	Week 8-9	3.6: Derivatives of log functions 3.7: Rates of change 3.9: Related rates 3.10: Linear Approximation 3.11: Hyperbolic functions
Week 2-3	*Chapter 2* 2.1: Tangent and velocity 2.2: The limit of a function 2.3: Calculating limits 2.4: The precise definition of a limit	Week 10-11	*Chapter 4* 4.1: Max. and min. values 4.2: The Mean Value Theorem 4.3: How derivatives affect the shape of a graph? 4.4: L'Hospital's Rule 4.5: Summary of Curve Sketching 4.6: Graphing
Week 4-5	2.5: Continuity 2.6: Limits at infinity 2.7: Derivatives and rate of change 2.8: Derivative as a function	Week 12-13	4.7: Optimization problems 4.9: Antiderivatives *Chapter 5* 5.1: Areas and distances 5.2: The definite integral
Week 6-7	*Chapter 3* 3.1: Derivatives of some functions 3.2: Product and Quotient Rules 3.3: Derivatives of trig functions 3.4: The Chain Rule 3.5: Implicit differentiation Review, Midterm	Week 14-15 Final	5.3: The Fundamental Theorem of Calculus 5.4: Indefinite Integrals 5.5: The Substitution Rule Review for the Final Final Week

Quizzes earn up to 10 points each, while the Midterm Exam earns up to *100 points*. Please, note that Moodle calculates your scores automatically, that will be valid for *individual Quizzes* only, but *not for your overall class performance*. It won't be Moodle, but your instructor who gives you the correct information for overall averages and scores!

- Quizzes: 40 %
- Midterm: 20 %
- Assessment: 5 %
- Attendance, participation and course evaluation: 5 %
- Final: 30 %
- Total: 100%

Grading Scale:

- A+: 100 – 95% - A: 94.9 – 90% - B+: 89.9 – 85% - B: 84.9 – 80%
- C+: 79.9 – 75% - C: 74.9 – 70% - D: 69.9 – 60% - F: 59.9 – 0%

A Pre-Final Score (including all but the Final Score) that you will have earned by your class work during the session including your Quiz Scores, Midterm Score, attendance, and participation scaled up to 100% will be calculated and provided to you before you take the Final Exam. Final and Semester Grade information can be obtained via email for a limited time after taking the Final.

Course policies:

Attend each class on time, participate and do the coursework. Attendance will be recorded. If you cut a class, it is *your responsibility* to make up any missed class material. Pagers, cell phones, or any distractive devices must be *turned off* in the classroom. Be courteous in class, don't chat, respect, and pay attention to your instructor/classmate who works on the board. *Focus on learning* so that your understanding benefits the most from your participation in the class activities.

Academic dishonesty and *plagiarism* are serious violations of university policy, punished by failing grade and/or suspension. *Never cheat* and *never be dishonest*!

Make-up policy: No make-up for missed Quizzes or homework. If you must miss a Test, let your instructor know it in advance. If your excuse is approved, you may make up *one Test* on the last week of classes. You need to make a written request for any make-up Test *at least one week before* you take it.

Best practices to follow for preparation to classes in this course:

Study *at least 2 hours* for this course every day. Start with a short *review* of the previous section, making sure that you understand and correct if needed the solutions for the assigned exercises. Also review the last Quiz you received back. *Then read through the current section* from your textbook paying special attention to the worked-out examples. When completed, *compare what you read with your class notes* and go through the examples we had in class again. After this, you are ready to try to *solve the new exercises* from the homework sheet*. Give your best effort*. After finish, check the solution key in the book. If your answer does not match, try again. Please note that the book may have, occasionally, typos in the solution key.

Write down the homework assignments in a separate booklet indicating your name, the date, the section, and the exercise number for each exercise. If there is a *work sheet* handed out, work out the answers to those questions, as well. If you get stuck, *seek help* from your instructor. Office hours, phone or email are all suitable ways to contact him. *Do not give up on trying until you succeed*. We'll have time to discuss solutions for the most challenging exercises in class. *Bottom line:* It is a challenging course. You'll have help available to succeed. You'll also need determination.

Make special preparation for *review classes, Quizzes,* and the *Midterm*. If you have a question, *don't hesitate to ask* in the class or visit me during my office hours. There is no guarantee that you would obtain a passing grade easily in this course, but if you follow these best practices, *you will have the best chances to earn a good grade.*

Policy on Academic Integrity:

Academic honesty is fundamental to our learning community. The University maintains a Code of Academic Integrity. A confirmed violation of that Code in this course will result in *failure* for the course. Cheating is strictly prohibited because it *devalues the degree* you are working hard to get. As a member of the University community, it is your responsibility to protect your educational investment by knowing and following the rules. *Academic dishonesty* and *plagiarism* are serious violations of university policy, punished by failing grade and/or suspension. *Never cheat* and *never be dishonest*!

Professional and ethical conduct is always expected. Unethical conduct includes any form of cheating, including plagiarism. The term "cheating" includes, but is not limited to: (1) use of any unauthorized assistance in taking quizzes, tests, or examinations, e.g., looking at other students' answers, using crib notes (including electronic), getting

information from another person via any kind of communication; (2) dependence upon the aid of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments; or (3) the acquisition, without permission, of tests or other academic material belonging to a member of the University faculty or staff. All assignments and tests must be your own work. Answers you write on the tests must come only from in your head or the information supplied in the test papers; anything else is cheating. Any evidence of cheating will result in a "0" for those assignments and/or exam or possibly an "F" for the entire course.

All Students should be aware that the Division of Mathematical Sciences takes the University *Code on Academic Integrity* very seriously and enforces it strictly. This means that there must not be any forms of plagiarism, i.e., copying of homework, class projects or assignments, or any form of cheating in quizzes and exams. *Academic dishonesty* includes cheating, fabricating or falsifying information or improper collaboration. *Plagiarism* is taking credit for someone else's work whether deliberately or unintentionally. This includes but is not limited to turning in all or part of a written assignment by *someone other than yourself* (a friend, an *internet source*, etc.) and claiming it as your own. If you use a *solution manual*, you must provide exact reference for it.

To be successful in this class, all work on exams and quizzes must be *yours and yours alone.* You may not receive outside help. On examinations and Quizzes, you will never be permitted to use your notes, textbooks, cell phones, or any other study aids. Should you see someone else engaging in this behavior, you must report it to myself or directly to the *Committee of Student Affairs.* That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to *report academic misconduct*, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and failing in this course. *So, don't cheat, it's simply not worth it.*

DSS Accommodation Services:
If you are a student with a disability who will require accommodation to participate in this course, please contact the Disability Support Services office to discuss your specific accommodation needs confidentially. You will need to provide me with a Faculty Notification letter from the DSS counselor. If you are not registered, you should do so immediately at the Student Center, Rotunda office #6, ph/ TTY: 671-735-2460, or uogdss@triton.uog.edu to coordinate your accommodation request.

To schedule an appointment on BOOK IT; https://sssablan.youcanbook.me
Office: Student Center Rotunda Office #6

Office Hours: Monday/Wednesday 9:00–noon and 1:00–3:30; Friday by appointment only
Office Phone Number/TTY: 671-735-2460
Email address: sssablan@triton.uog.edu

Family Education Rights and Privacy Act (FERPA):
The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. These rights for students, parents and school officials can be viewed at: http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html

Tobacco Policy:
The University of Guam is a tobacco-free campus and has a total ban on sales, smoking and distribution and use of tobacco and tobacco-based products on campus. UOG is committed to promoting the health, wellness and social well-being of the University Community, the people of Guam and the Western Pacific.

Contact for classmates:
You are encouraged to exchange *contact information* with your classmates. Choose at least one *study partner*. Contact your classmate(s) if you miss a class and make up the missed material. You are also encouraged to form *study groups.*

List here some contact information from your classmates:

Name	Phone Number	Email address	Study partner? (y/n)

LEARNING OUTCOMES INFORMATION

Intended Student Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to

- *MA 203 SLO1 – demonstrate* understanding of limits, continuity, and derivatives of functions,
- *MA 203 SLO1* – use the product, quotient, and chain rules for direct and implicit differentiation,
- *MA 203 SLO1 – find* derivatives of polynomial, rational, exponential, logarithmic, trigonometric, and hyperbolic functions,
- *MA 203 SLO1 – use* differential calculus in curve sketching and problems-solving,
- *MA 203 SLO1 – find* definite and indefinite integrals of a limited number of elementary functions.

Mathematics Program Learning Outcomes (PLOs):

Students completing the mathematics program at the UOG will:

- *MA PR PLO1 – demonstrate* critical thinking, problem solving skills and ability to *use* mathematical methods by identifying, evaluating, classifying, analyzing, synthesizing data and abstract ideas in various contexts and situations.
- *MA PR PLO2 – exhibit* a sound conceptual understanding of the nature of mathematics, and *demonstrate* advanced mathematical skills in mathematical analysis, modern algebra, and other mathematical discipline(s).
- *MA PR PLO3 – argue* and *reason* using mathematics, read, *create* and *write* down logically correct mathematical proofs, *use* exact mathematical language and *communicate* mathematics efficiently orally, in writing and using information technology tools.
- *MA PR PLO4 – apply* abstract thinking, mathematical methods, models, and current practices in the sciences, including state-of-the-art mathematical software, to solve problems in theoretical mathematics or in a diverse area of mathematical applications.
- *MA PR PLO5 – show* maturity in mathematical knowledge and thinking that prepares and encourages students to pursue graduate studies in mathematics or in related fields.
- *MA PR PLO6 – demonstrate* an appreciation of and enthusiasm for inquiry, learning and creativity in mathematical sciences, a sense of exploration that enables them to pursue lifelong learning and up-to-date professional expertise in their careers through various areas of jobs, including governmental, business, or industrial jobs in mathematics, related sciences, education or technology.

Institutional Learning Outcomes (ILOs):

After graduating at the UoG, successful students will *demonstrate* and *apply:*

- *UoG ILO 1* – mastery of *critical thinking* and *problem solving,*
- *UoG ILO 2* – mastery of *quantitative analysis,*
- *UoG ILO 3* – effective oral and written *communication,*
- *UoG ILO 4* – understanding and appreciation of *culturally diverse* people, ideas, and values in a democratic context,
- *UoG ILO 5 – responsible* use of knowledge, natural resources, and technology,
- *UoG ILO 6* – an appreciation of the *arts* and *sciences*,
- *UoG ILO 7* – an interest in *personal development* and *lifelong learning.*

	MA PR PLO1	*MA PR PLO2*	*MA PR PLO3*	*MA PR PLO4*	*MA PR PLO5*	*MA PR PLO6*
MA 203 SLO1	X		x	x		
MA 203 SLO2	X		x	x		
MA 203 SLO3	x		x	x		
MA 203 SLO4	x		x	x		
MA 203 SLO5	x		x	x		

	UoG ILO1	*UoG ILO2*	*UoG ILO3*	*UoG ILO4*	*UoG ILO5*	*UoG ILO6*	*UoG ILO7*
MA PR PLO1	x	x					
MA PR PLO2	x	x					
MA PR PLO3	x	x	x				
MA PR PLO4	x	x	x			x	
MA PR PLO5					x	x	
MA PR PLO6					x	x	x