

SOUTHWESTERN ILLINOIS COLLEGE
COURSE SYLLABUS
Analytic Geometry & Calculus I – Math 203-003
Summer Semester, 2013

GENERAL INFORMATION

Instructor: Daniel McGibney
Class time: MWTH 6:30-9:55 PM
Semester hours: 5
Class Location: **Campus:** BC **Room:** MC 2004
Phone: 1-618-530-4095
Toll Free in Illinois: 1-866-942-SWIC (7942)
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COURSE DESCRIPTION

The calculus sequence is designed for students whose area of concentration is mathematics, science, or engineering. The Mathematics Department at Southwestern Illinois College believes calculus students must become aware of the advances in technology and its uses in mathematics, particularly in calculus. Therefore, computer technology is integrated in the calculus sequence through the use of the *Mathematica* software package. Students are also required to use graphing calculators on some assignments and/or tests.

The MATH 203 course content includes the topics of limits of functions, derivatives, extrema of functions, tangents, asymptotes, definite and indefinite integrals, differentiation and integration of transcendental functions, and applications of calculus in physical science and engineering. (IAI M1 900-1)

PREREQUISITES

MATH 114 (with a grade of “C” or better) or math placement above MATH 114 or divisional approval; completion of the geometry requirement; and concurrent enrollment in ENG 92 or reading placement above ENG 92 level.

COURSE OBJECTIVES

- A. Limits The student will be able to:
1. Explain the concept of a limit.
 2. Determine both graphically and algebraically when a limit does not exist.
 3. Apply the basic properties of limits.
 4. Evaluate limits of functions.
 5. Explain the concept of a continuous function.
 6. Show algebraically if a function is discontinuous.

7. State and utilize the Intermediate Value Theorem.
8. State the formal definition of a limit.
9. Prove the limit of a linear function.

B. Derivatives The student will be able to:

1. Determine the equation of a line tangent to a curve at a point (x, y) .
2. Connect the concepts of derivatives and instantaneous rate of change.
3. Explain the difference between average and instantaneous rate of change.
4. Write the limit definition of a derivative.
5. Use the definition to find derivatives of functions.
6. Apply the power rule, product rule, and quotient rules to determine derivatives.
7. Find the derivatives of trigonometric, inverse trigonometric, exponential, logarithmic, and hyperbolic functions.
8. Apply the chain rule to determine derivatives.
9. Determine the derivative of a function using logarithmic differentiation.
10. Use implicit differentiation to find the slope of a curve that is not a function.
11. Apply implicit differentiation to solve related rates problems.
12. Determine when the Mean Value Theorem can and cannot be applied.
13. Apply the Mean Value Theorem in both proofs and practical applications.

C. Applications of Differentiation The student will be able to:

1. Compute linear approximations and differentials of functions.
2. State L'Hôpital's Rule and find limits for indeterminate forms, including exponential, using L'Hôpital's Rule.
3. Find absolute/relative extrema on closed and open intervals.
4. Determine when a function is increasing/decreasing without graphing aids.
5. Determine the concavity of a function without graphing aids.
6. Sketch curves including extrema and points of inflection.
7. Apply the principles of Calculus to real situations and find optimal solutions.
8. Solve problems using visual and abstract problem solving in tandem.
9. Apply derivatives to determine how quantities fluctuate in various real-world applications.

D. Integration The student will be able to:

1. Write Riemann sums that approximate areas and write the integral that would represent the exact area.
2. Explain the concept of signed area.
3. Explain the basic properties of integration.
4. Explain the fundamental relationship between area and antiderivatives.
5. Explain the connection between integration and differentiation.
6. Apply the Fundamental Theorem of Calculus to solve problems.
7. Integrate using the technique of substitution.

E. Logarithms and Exponentials The student will be able to:

1. Apply the basic properties of logarithms and exponentials.

2. State the integral definition of natural logarithms.
3. Find integrals of expressions that involve logarithms and exponentials.
4. Explain the relationship between the derivatives of inverse functions.

TEXTBOOK

Calculus—Early Transcendentals

Stewart, 7th edition, 2012

Brooks/Cole, Cengage Learning

GRADING PROCEDURE

Tests (4):	50%
Homework:	20%
Projects:	10%
Final Exam:	20%

Students will be evaluated based on their performance as specified above. Letter grades will be assigned using the standard grading scale: 100-90 A, 89-80 B, 79-70 C, 69-60 D, and 59-0 F.

Homework will be assigned every class via SWIC email. It is the responsibility of the student to complete the problems. Homework will either be collected in class or via online transmission at the discretion of the instructor. **No late homework or projects will be accepted.**

In addition to the regular assigned homework, some problems may be assigned as suggested problems. It is highly encouraged that you work out these suggested problems.

ATTENDANCE POLICY

College Policy: You are expected to be present for all assigned classes, lectures or laboratory sessions. If you are absent, you must show your instructor that your absence has been for a good cause. If you are absent more times during the semester than the number of times the class meets per week, you may be dropped from the course at the discretion of the instructor. When a student is dropped by an instructor with an effective date before the midterm date of the class a “W” will be recorded. When a student is dropped for non-attendance by an instructor with an effective date after the midterm date, the instructor will have the prerogative to assign a grade of “WF” or “W”.

ACADEMIC RIGOR

You are enrolled in an academically rigorous college course. Your success in this course will require a significant investment of time outside of the class. According to the Administrative Rules of the Illinois Community College Board (section 1501.309), it is assumed that the student will invest at least two hours of outside study time for each hour of classroom lecture time. This course is part of the Illinois Articulation Initiative (IAI). The IAI is based upon the assumption that community colleges and universities are equal partners in delivering lower-division baccalaureate courses. This course is considered

equal in scope, quality, and rigor to comparable courses offered at other colleges and universities in Illinois.

ADDITIONAL INFORMATION

Disability & Access Center - Students with disabilities who believe that they may need accommodations are encouraged to contact the Disability & Access Center at 618-222-5368 or 618-234-3347 (TDD) to ensure that such accommodations are implemented in a timely fashion.

Student Learning Outcomes - The assessment of student learning is an integral part of the educational experience at Southwestern Illinois College. To this end, the faculty continually assess student learning to improve student success. Occasionally you will be requested to participate in college-wide and discipline specific assessment activities. Please take these assessments seriously. The data that is collected will provide valuable information to faculty and will be used to improve student learning at SWIC.

Academic Dishonesty-College Policy - Academic misconduct includes, but is not limited to cheating, plagiarism and forgery, failure or refusal to follow clinical practice standards, and soliciting, aiding, abetting, concealing, or attempting such acts. Plagiarism is defined as the act of representing the work of another as one's own. Plagiarism may consist of copying, paraphrasing, or otherwise using written or oral work of another without proper acknowledgment of the source or presenting oral or written material prepared by another as one's own.

SWIC Know online orientation - All new students are encouraged to participate in the SWIC Know online orientation, where students learn about the many programs and services available to help them succeed in college. SWIC know orientation can be found at eSTORM.SWIC.edu.

Policy for Inclement Weather Conditions – During times of inclement weather, Southwestern Illinois College has three options for dealing with the situation: cancel classes and cease all business, exercise the delayed-start option, or keep the college open. If the college chooses to use the delayed-start option rather than close, **the college will open at 10 a.m.** The decision to cancel classes or exercise the delayed-start option will be posted on the home page of Southwestern's Web site at www.swic.edu as well as broadcast on FOX 2 (KTVI), KMOV-TV Channel 4, KSDK-TV Channel 5, and radio stations KMOX-AM 1120 and WIL-FM 92.3.

SWIC Alert: This free emergency alert system sends text messages and/or emails to students and employees who have signed up for it. The only cost is what the cell phone carrier charges to receive text messages. You may choose to receive text messages or emails for a specific campus or all campuses. Once enrolled, your

account is active for one year. You will receive notice 30-days before your enrollment will expire.

How to Register

1. Log in to eSTORM at estorm.swic.edu
2. Click Main Menu in the upper left
3. Scroll over SWIC Alert and choose SWIC Alert Signup

Emergency Procedures - General information about the emergency response and evacuation procedures for Southwestern are publicized each year as part of the institution's Clery Act compliance efforts and that information is available on the Southwestern Public Safety website. Emergency Response Guides and Plans are available on the Public Safety website at SWIC.edu/publicsafety.

Official Communication- Your student e-mail account is the official method to communicate between you and your instructor. Official communication will not be sent to your personal e-mail (yahoo, wildblue, gmail etc.).

Phones in Classroom – All cell phones and electronic devices should be turned off or silenced prior to entering the classroom. Any permission for usage should be obtained prior to the start of class and is at the discretion of the instructor.

TOPICAL OUTLINE

Week	Monday	Wednesday	Thursday
6/3/2013			
6/10/2013			Test 1
6/17/2013		Proj 1 due	
6/24/2013			Test 2
7/1/2013			No Class
7/8/2013	Proj 2 due		Test 3
7/15/2013			
7/22/2013	Test 4	Review	Final Exam

The above syllabus may be revised at the discretion of the instructor. Changes will be announced in class. It is recommended that students come to class every day so that they may be aware of any changes.