

CALCULUS FOR ENGINEERING TECHNOLOGY I

The University of Toledo

Mathematics & Statistics Department, College of Natural Sciences and Mathematics
MATH2450-0XX, CRN XXXXX

Instructor:	(Insert Name)	Class Location:	(Insert Building/Room)
Email:	(Insert Email Address)	Class Day/Time:	(Insert Days/Time)
Office Hours:	(Insert Days/Time)	Lab Location:	(Insert Bldg/Office #, if applicable)
Office Location:	(Insert Building/Office #)	Lab Day/Time:	(Insert Days/Time, if applicable)
Office Phone:	(Insert Phone Number)	Credit Hours:	4
Term:	(Insert Semester/Year)		

COURSE DESCRIPTION

Differential calculus of algebraic and trigonometric functions, including limits, curve sketching, motion, maxima/minima, related rates, integral calculus of algebraic functions.

STUDENT LEARNING OUTCOMES

Upon successful completion of this class a student should be able to:

- **Derivative:** Use the concept of the limit definition to verify the power rule. Understand the product rule, quotient rule, implicit differentiation, and the chain rule. Apply the derivative to motion problems and find the tangent lines of curves.
- **Applications of the Derivative:** Utilize several differentiation techniques and by understanding the first and second derivative tests, be able to sketch curves, identify relative maximums and minimums, and solve related rates problems.
- **Derivative of Transcendental Functions:** Find the derivatives of trigonometric functions, their inverse functions, and exponential and logarithmic functions. Apply the derivative of these functions in various real world problems and understand L'Hospitals rule.
- **The integral:** Find indefinite integrals using integration formulas and the method of substitution. Find constants of integration and the area under a single curve.
- **Applications of Integration:** Find the area between two curves and revolve a function about the x-axis and y-axis using both the disk method and shell method.

PREREQUISITES

Minimum grade of C- in Math 1320 and Math 1330 or in Math 1340, or satisfactory placement test scores. If a student's ACT-Math score is 22 or greater a score of 12 or greater is required on the Trigonometry placement test. If a student's ACT-Math score is 20 or 21, then the student must have a score of 12 or greater on the Trigonometry Placement test and a score of 12 or greater on the College Algebra placement test. For student's with ACT-Math scores of 20 or 21 who score between 9 and 11 inclusive on the Trigonometry placement test and have College Algebra placement test scores of 15 or greater, they may enroll in MATH 2450 if they concurrently enroll in Trigonometry Review MATH 1980. Students who enroll in MATH 2450 but have failed prerequisite courses may be administratively dropped from the class. General education curriculum core course meets the skills requirements in mathematics.

TEXTBOOK: *Technical Calculus - Special Edition for UT*, Ewen, Gray, Trefzger, and Colley (ISBN:9780536987273).

UNIVERSITY POLICIES:

POLICY STATEMENT ON NON-DISCRIMINATION ON THE BASIS OF DISABILITY (ADA)

The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.

ACADEMIC ACCOMMODATIONS

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office (Rocket Hall 1820; 419.530.4981; studentdisabilitysvs@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see: <http://www.utoledo.edu/offices/student-disability-services/sam/index.html>

ACADEMIC POLICIES:

MISSED CLASS POLICY

If circumstances occur in accordance with The University of Toledo Missed Class Policy (found at <http://www.utoledo.edu/policies/academic/undergraduate/index.html>) result in a student missing a quiz, test, exam or other graded item, the student must contact the instructor in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.

ACADEMIC DISHONESTY

Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at <http://www.utoledo.edu/dl/students/dishonesty.html>) will result in an F in the course or an F on the item in question, subject to the determination of the instructor. Non-Discrimination Policy: The University of Toledo is committed to a policy of equal opportunity in education, affirms the values and goals of diversity.

STUDENT PRIVACY

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the Confidentiality of Student Records (FERPA) section of the University Policy Page at <http://www.utoledo.edu/policies/academic/undergraduate/index.html>

GRADING AND EVALUATION

Your syllabus should describe the methods of evaluation whether quizzes, exams, or graded assignments. The usual procedure is to give at least three 1-hour in-class exams and a two hour final exam. If quizzes are not used as a portion of the grade, then four 1-hour exams are recommended. How each evaluation method is to count toward the class grade should be described and a grading scale or description of a grading procedure should be provided. It should be kept in mind when scheduling quizzes and exams that the last day to add/drop the class is the end of the second week of classes and the last day to withdraw from the class is the end of the tenth week. By these dates, students like to have some measure of their progress in the class.

IMPORTANT DATES

The instructor reserves the right to change the content of the course material if he perceives a need due to postponement of class caused by inclement weather, instructor illness, etc., or due to the pace of the course.

MIDTERM EXAM:**FINAL EXAM:****OTHER DATES**

The last day to drop this course is:

The last day to withdraw with a grade of "W" from this course is

STUDENT SUPPORT SERVICES:

Free math tutoring on a walk-in basis is available in the Math Learning and Resources Center located in Rm B0200 in the lower level of Carlson Library (phone ext 2176). The Center operates on a walk-in basis. MLRC hours can be found at <http://www.math.utoledo.edu/mlrc/MLRC.pdf>

Suggested Schedule for MATH 2450

Chapter	Section	Topic	Hours	Learning Objectives
Chapter	2	The Derivative	9.5 hours	
	2.1	Motion	1.0	Limits
	2.2	The Limit	1.0	Limits
	2.3	Slope of a Tangent Line to a Curve	0.5	Limits
	2.4	The Derivative	0.5	Derivatives
	2.5	Differentiation of Polynomials	1.0	Derivatives
	2.6	Derivatives of Products and Quotients	2.0	Derivatives
	2.7	Derivatives of a Power	1.5	Derivatives
	2.8	Implicit Differentiation	1.0	Derivatives
	2.10	Higher Derivatives	1.0	Higher Order Derivatives
Chapter	3	Applications of the Derivative	10 hours	
	3.1	Curve Sketching	1.5	Applications of Derivatives
	3.2	Using the Derivative in Curve Sketching	2.0	Applications of Derivatives
	3.3	More Curve Sketching	2.0	Applications of Derivatives
	3.5	Maximum and Minimum Problems	2.5	Applications of Derivatives
	3.6	Related Rates	1.0	Higher Order Derivatives
	3.7	Differentials	1.0	Higher Order Derivatives
Chapter	4	Derivatives of Transcendental Functions	12 hours	
	4.1	Trigonometric Functions	2.0	Derivatives of Transcendentals
	4.2	Derivatives of Sine and Cosine Functions	2.0	Derivatives of Transcendentals
	4.3	Derivatives of Other Trigonometric Functions	1.0	Derivatives of Transcendentals
	4.4	The Inverse of Trigonometric Functions	1.0	Derivatives of Transcendentals
	4.5	Derivatives of Inverse Trigonometric Functions	1.0	Derivatives of Transcendentals
	4.6	Exponential and Logarithmic Functions	1.0	Derivatives of Transcendentals
	4.7	Derivatives of Log Functions	1.0	Derivatives of Transcendentals
	4.8	Derivatives of Exponential Functions	1.0	Derivatives of Transcendentals
	4.9	L'Hospital's Rule	1.5	Indeterminate Forms
	4.10	Applications	0.5	Higher Order Derivatives
Chapter	5	The Integral	6.5 hours	
	5.1	The Indefinite Integral	2.0	Antiderivatives
	5.2	The Constant of Integration	1.0	Antiderivatives
	5.3	Area Under a Curve	2.0	Definite Integration
	5.4	The Definite Integral	1.5	Definite Integration
Chapter	6	Applications of Integration	6 hours	
	6.1	Area between Curves	2.0	Definite Integration
	6.2	Volumes of Revolution: Disk Method	2.0	Definite Integration
	6.3	Volumes of Revolution: Shell Method	2.0	Definite Integration
		Total Hours	44	

CLASS SCHEDULE

Syllabus should provide a list of sections to be covered and it is advisable to give an exam schedule. It is also important to list dates such as the last day to drop, the last day to withdraw, and exam dates. The suggested number of periods needed for each section is listed above. Given the fact that the class schedule includes two 1-hour recitations giving the class 5 contact hours per week, the suggested lecture time to be devoted to these topics leaves ample time for problem solving and review. Instructors find that providing ample time for review and working problems is important for student success in this course. Most students will enroll in MATH 2460 which has MATH 2450 as a prerequisite.