

Time and Location: MTRF 1:00-1:50 ST-S 0107

Instructor: Seung-Moon Hong, UH2030J, (419)530-2804, seungmoon.hong@utoledo.edu

Office hours: M 2:00-4:00, W 12:00-3:00

Textbook: *Thomas' Calculus Early Transcendentals*, 12th edition by George B. Thomas, Maurice D. Weir and Joel Hass. The textbook is available online at a 30% discount in electronic form from www.coursesmart.com. In this case, students will be responsible for printing it or accessing it electronically.

Catalog Description: Limits, differentiation, Fundamental Theorem of Calculus, Mean Value Theorem, curve sketching, maxima/minima, definite and indefinite integrals, applications.

Prerequisites: Before enrolling in Math 1850, students must attain sufficient ACT MATH, College Algebra and Trigonometry placement test results or passing grades in MATH1320 and MATH 1330 or MATH1340. Students with marginal trig placement test scores take MATH1980 concurrently. For detail on the scores on ACT MATH, College Algebra and Trigonometry placement test required for MATH 1850, see the department's placement table.

Resources: There are resources available for students who need extra help outside my office hours. For this course the most reliable source of tutorial help can be found at the Mathematics Learning and Resource Center, B0200, located in the basement of Carlson Library-phone ext. 2176. For MLRC hours, see <http://math.utoledo.edu/mlrc/MLRC.pdf>.

Homework: It will be assigned but not collected.

Presentations and Quizzes: There will be a quiz weekly. Some will be announced and some will not. No late quiz is accepted. To allow some unexpected cases, 1-2 of the lowest quizzes will be dropped.

Exams: There will be two in class exams and a comprehensive final exam given during scheduled final exam period for the section.

Calculator: No calculators with symbolic or graphing capabilities are allowed during quizzes and exams. Cell Phones/Smart Phones are not allowed during quizzes and exams.

Cell Phones and Laptop Computer Usage: Please turn off your cell phone and keep it stored away. You can use a laptop computer to take notes, but it cannot be used for any other purpose.

Attendance: Your attendance to all classes is strongly encouraged. Any announcements made in class regarding the schedule of future classes, exams or other information takes precedence over this outline.

Missed Quizzes and Exams: If you miss a class you are responsible for obtaining the material, notes, etc. Absence for quizzes and exams can only be excused if covered by the University's missed class policy. The policy specifically mentions absences from class may be excused for personal emergencies, religious observances, participation in certain UT sponsored activities, and government required activities. For more information see http://www.utoledo.edu/facsenate/missed_class_policy.html. The student must contact me 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.

Drop/Withdrawal: In general the last day to drop or add this course is the Friday of the second week of classes. The last day to withdraw from this class with a grade of W is the Friday of the tenth week of classes.

Academic Honesty: Successful completion of this course requires personal integrity and honest academic effort. Any dishonest activities will not be tolerated in this course. Any student who engages in dishonest behavior will, at the instructor's discretion, fail the exam, fail the course, or more serious consequences. See the University's "Policy Statement on Academic Dishonesty".

Non-Discrimination Policy: The University of Toledo is committed to a policy of equal opportunity in education, affirms the values and goals of diversity.

Students with Disabilities: The University will make reasonable academic accommodations for students with documented disabilities. Students should contact the Student Disability Services (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>

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>.

Learning objectives:

The successful Calculus I students should be able to apply the following competencies to a wide range of functions, including piecewise, polynomial, rational, algebraic, trigonometric, inverse trigonometric, exponential and logarithmic:

1. **Limits:** Determine the existence of, estimate numerically and graphically and find algebraically the limits of functions. Recognize and determine infinite limits and limits at infinity and interpret them with respect to asymptotic behavior.
2. **Continuity:** Determine the continuity of functions at a point or on intervals and to distinguish between the types of discontinuities at a point.
3. **Derivatives:** Determine the derivative of a function using the limit definition and derivative theorems. Interpret the derivative as the slope of a tangent line to a graph, the slope of a graph at a point, and the rate of change of a dependent variable with respect to an independent variable.
4. **Indeterminate Forms:** Evaluate limits that result in indeterminate forms, including the application of L'Hopital's Rule.
5. **Higher Order Derivatives:** Determine the derivative and higher order derivatives of a function explicitly and implicitly and solve related rates problems.
6. **Graph Sketching:** Determine absolute extrema on a closed interval for continuous functions and use the first and second derivatives to analyze and sketch the graph of a function, including determining intervals on which the graph is increasing, decreasing, constant, concave up or concave down and finding any relative extrema or inflection points. Appropriately use these techniques to solve optimization problems.

7. **Antiderivatives:** Determine antiderivatives, indefinite and definite integrals, use definite integrals to find areas of planar regions, use the Fundamental Theorems of Calculus, and integrate by substitution.

Grading: The following percentages are assigned to the components of the student's grade.

Representation/Quizzes 30%, Exam I 20%, Exam II 20%, Final Exam 30%.

The final letter grade will be based on your total average as follows:

| Total average | below 60% | 60% – 69% | 70% – 79% | 80% – 89% | 90% – 100% |
|---------------|-----------|-----------|-----------|-----------|------------|
| Grade | F | D | C | B | A |

Calendar:

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| Last day to add/drop | Sep 8 |
| Exam I | Sep 25 |
| Exam II | Oct 30 |
| Last day to withdraw | Oct 31 |
| Final Exam | Dec 19, 8:00-10:00 |

Schedule:

| Week | Subject |
|------|---|
| 1 | 1.3 Trigonometric Functions 1.5 Exponential Functions |
| 2 | 1.6 Inverse Functions and Logarithms |
| 3 | 2.2 Limit of a Function and Limit Laws 2.4 One-Sided Limits |
| 4 | 2.5 Continuity 2.6 Limits Involving Infinity; Asymptotes of Graphs |
| 5 | 3.1 Tangents and the Derivative at a Point 3.2 The Derivative as a Function Exam I |
| 6 | 3.3 Differentiation Rules 3.4 The Derivative as a Rate of Change |
| 7 | 3.5 Derivatives of Trigonometric Functions 3.6 The Chain Rule |
| 8 | 3.7 Implicit Differentiation 3.8 Derivatives of Inverse Functions and Logarithms |
| 9 | 3.9 Inverse Trigonometric Functions 3.10 Related Rates 3.11 Linearization and Differentials |
| 10 | 4.1 Extreme Values of Functions 4.3 Monotonic Functions and the First Derivative Test Exam II |
| 11 | 4.4 Concavity and Curve Sketching 4.5 Indeterminate Forms and L'Hopital's rule |
| 12 | 4.6 Applied Optimization 5.1 Area and Estimating with Finite Sums |
| 13 | 5.3 The Definite Integral 5.4 The Fundamental Theorem of Calculus |
| 14 | 5.5 Indefinite Integrals and the Substitution method |
| 15 | 5.6 Substitution and Area Between Curves |