

Instructor: Dr. Franz X. Tanner
Office: 209 Fisher Hall
Phone: 487 2190
E-mail: tanner@mtu.edu
Web: <http://www.math.mtu.edu/~tanner>
Lectures: MWF 4:05–4:55 pm, 326 Fisher Hall
Office Hours: MWF 3:00–4:00 pm and by appointment

Prerequisites: Calculus with Technology II or equivalent, or consent of instructor.

Textbook: Hughes-Hallet et al., Calculus, Single and Multivariable, fourth edition, Wiley 2005.

Laboratory: You **must** attend the weekly lab sessions in the Mathlab (Fisher 330–331). For details see http://wiki.mathlab.mtu.edu/mediawiki/index.php/Main_Page.

Quizzes: A short in-class quiz will be given once a week.

Hourly Exams: There will be two in-class hourly exams.

Final Exam: The final exam is a two-hour, comprehensive, in-class exam as scheduled by the university. **No early or late final exam will be given.**

Grading: The course grade will be calculated using the straight percentage scale

$A \geq 90\% > AB \geq 85\% > B \geq 80\% > BC \geq 75\% > C \geq 70\% > CD \geq 65\% > D \geq 60\% > F$

and the following weighting system:

Labwork	10%
Quizzes	20%
Two hourly exams (20% each)	40%
Comprehensive Final Exam	30%
Total	100%

Class Policies:

- Attendance of classes is mandatory.
- In order to be given full credit on quizzes and exams, all work must be shown in a neat and orderly manner.
- The lowest quiz grade will be dropped.
- **There are no make-up quizzes.**
- **Makeup exams only with a written excuse from the Dean of Students.**

Important Dates:

- Last day to drop with a full refund: Wednesday, September 9.
- Drop-date (no grade): Friday, September 18.
- Drop with a "W": Friday, October 23.

Affirmative Action Notice: "MTU complies with all federal and state laws and regulations regarding discrimination, including the ADA Act of 1990. If you have a disability and a need, a reasonable accommodation for equal access to education or services can be made through the Dean of Students Office (Gloria Melton 487-2212). For concerns regarding discrimination of any kind, contact your advisor, department head, or affirmative action office."

Course Schedule and Assignments

Date	Section	Topic	Homework Problems
Aug 31	12.1	Functions of Two Variables	5, 6, 8, 9, 11, 22, 31, 33
Week 1	12.2	Graphs of Functions of Two Variables	1–10, 14
	12.3	Contour Diagrams	1, 3, 5, 7, 16, 20, 21
Sep 07		Labor Day (no class Sep 07)	
Week 2	12.4	Linear Functions	1, 3–15, 17, 19
		Keweenaw Day (no class Sep 11)	
Sep 14	12.5	Functions of Three Variables	1, 2, 3, 5, 7, 9, 15–19, 24
Week 3	14.1	The Partial Derivative	1, 4, 9, 15, 19
	14.2	Computing Partial Derivatives	1, 3, 5, 13, 16, 23, 33, 36,
Sep 21	14.3	Local Linearity and the Differential	1, 3, 5, 6, 7, 9, 11, 16, 22, 23, 25
Week 4	14.4	Directional Derivatives in the Plane	7, 9, 11, 13, 15, 19, 23, 29, 31, 53, 54, 57, 59, 61, 63
	14.5	Directional Derivatives in Space	1, 3, 10, 11, 13, 15, 17, 21, 28, 37
	14.6	The Chain Rule	1, 3, 5, 7, 9, 11, 15, 19, 20, 28
Sep 28	14.7	Second-Order Partial Derivatives	1, 3, 5, 11, 13, 19, 29, 31
Week 5	15.1	Local Extrema	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21
	15.2	Optimization	20, 23, 27, 28, 29
Oct 05	15.3	Constrained Optimization	1, 7, 11
Week 6		Homecoming (no class Oct 09)	
Oct 12	16.1	Integrals of Functions of Two Variables	2, 5, 9, 11, 13, 15, 17, 19, 21, 23
Week 7		Review	
		Exam I (Friday, October 16)	
Oct 19	16.2	Iterated Integrals	1, 3, 5, 7, 9, 11, 13, 15, 16, 17, 26, 27, 29, 35, 37, 39, 41
Week 8	16.3	Triple Integrals	1, 5, 7, 9, 11, 13, 18, 19, 21, 29, 31, 47, 50
	16.4	Double Integrals in Polar Coordinates	1, 2, 3, 4, 5, 7, 9, 13, 15, 17, 20
Oct 26	16.5	Cylindrical and Spherical Integrals	1, 3, 5, 6, 7, 8, 9, 11, 15, 18, 28, 37
Week 9	17.1	Parametrized Curves	1, 3, 9, 11, 13, 15, 17, 21, 25, 27, 29, 33, 48, 57
	17.2	Motion, Velocity and Acceleration	1, 7, 9, 11, 13, 15, 17
Nov 02	17.3	Vector Fields	1, 3, 7, 9, 11, 15, 20, 21, 23
Week 10	17.4	The Flow of a Vector Field	3, 4, 7, 10, 18
	17.5	Parametrized Surfaces	1, 3, 8, 15, 17, 23, 25, 27
Nov 09	18.1	The Idea of a Line Integral	1, 2, 3, 4, 5, 9, 15, 21, 23
Week 11	18.2	Line Integrals of Parametrized Curves	1, 3, 5, 7, 9, 13, 15, 17
	18.3	Gradient and Path-Independent Fields	11, 13, 15, 17, 21, 31
Nov 16	18.4	Path-Dependent Fields, Green's Theorem	1, 3, 5, 7, 9, 11, 15, 22, 25
Week 12	19.1	The Idea of a Flux Integral	1, 11, 22, 25, 33, 35, 37
	19.2	Flux Integrals: Graphs, Cylinders and Spheres	1, 3, 9, 19
Thanksgiving Break: November 23 – 27			
Nov 30	20.1	The Divergence of a Vector Field	3, 5, 7, 9, 13
Week 13		Review	
		Exam II (Friday, December 4)	
Dec 07	20.2	The Divergence Theorem	3, 5, 7
Week 14	20.3	The Curl of a Vector Field	7, 9, 13, 17, 21, 25
	20.4	Stokes' Theorem	1, 3, 7, 11, 28