

Instructor: Dr. Franz X. Tanner
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Web: <http://www.math.mtu.edu/~tanner>
Lectures: MWF 02:05–02:55 pm, 325 Fisher Hall
Office Hours: MWF 03:05–03:55 pm and by appointment

Prerequisites: Calculus with Technology II or equivalent, or consent of instructor.
Textbook: Hughes-Hallet et al., *Calculus, Single and Multivariable*, fifth edition, Wiley 2009.

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 refund: Wednesday, September 7.
- Drop-date (no grade): Friday, September 16.
- Drop with a "W": Friday, October 21.

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 29	12.1	Functions of Two Variables	3, 4, 9, 11, 24, 29
Week 1	12.2	Graphs of Functions of Two Variables	1–10, 15
	12.3	Contour Diagrams	5, 7, 9, 11, 17, 21, 22
Sep 05		Labor Day (no class Sep 05)	
Week 2	12.4	Linear Functions	9, 10, 11, 12, 14, 19, 25, 27, 29
		K-day (no class Sep 09)	
Sep 13	12.5	Functions of Three Variables	3, 5, 9, 11, 13, 15, 17, 18, 19, 21, 23
Week 3	14.1	The Partial Derivative	1, 5, 7, 17, 23
	14.2	Computing Partial Derivatives	1, 3, 5, 13, 16, 23, 33, 37
Sep 20	14.3	Local Linearity and the Differential	1, 3, 5, 7, 9, 10, 11, 13, 15, 21, 27, 28, 29
Week 4	14.4	Directional Derivatives in the Plane	1, 3, 7, 9, 11, 13, 15, 19, 23, 59, 61, 68, 69, 72, 74
	14.5	Directional Derivatives in Space	5, 7, 9, 17, 21, 23, 25, 29, 35, 42, 63, 64
Sep 27	14.6	The Chain Rule	1, 3, 5, 7, 9, 11, 18, 19, 21, 31
Week 5	14.7	Second-Order Partial Derivatives	1, 3, 5, 11, 13, 29, 31, 33
	15.1	Local Extrema	3, 5, 7, 10, 12, 14, 24, 26, 27
Oct 04	15.1	Local Extrema (cont.)	
Week 6	15.2	Optimization	17, 21, 22, 23, 25
	15.3	Constrained Optimization	1, 9, 12
Oct 11	16.1	Integrals of Functions of Two Variables	4, 7, 9, 11, 13, 15, 17, 19, 21, 23
Week 7		Review	
EXAM I: Wednesday October 12, 6–7 pm, Fisher 135			
Oct 18	16.2	Iterated Integrals	3, 9, 11, 17, 19, 21, 22, 23, 24, 27, 35, 36, 37, 43, 44, 45, 47
Week 8	16.3	Triple Integrals	1, 5, 7, 9, 11, 13, 24, 25, 27, 39, 41, 56, 59
	16.4	Double Integrals in Polar Coordinates	3, 4, 9, 11, 13, 15, 17, 19, 21, 24
Oct 25	16.5	Cylindrical and Spherical Integrals	21, 23, 25, 31, 33, 37, 39, 41, 52
Week 9	17.1	Parametrized Curves	7, 9, 15, 17, 19, 21, 25, 29, 33, 35, 55, 59
	17.2	Motion, Velocity and Acceleration	3, 11, 13, 15, 17, 19, 28
Nov 01	17.3	Vector Fields	5, 7, 9, 11, 13, 17, 19, 29, 30, 32
Week 10	17.4	The Flow of a Vector Field	3, 4, 7, 10, 18
	17.5	Parametrized Surfaces	1, 3, 8, 15, 17, 19, 21, 28, 30, 33
Nov 08	18.1	The Idea of a Line Integral	1, 3, 5, 7, 11, 15, 21
Week 11	18.2	Line Integrals of Parametrized Curves	3, 5, 7, 9, 11, 13, 15, 17, 30
	18.3	Gradient and Path-Independent Fields	9, 11, 13, 15, 17, 23, 28, 41
Nov 15	18.4	Path-Dependent Fields, Green's Theorem	1, 5, 7, 9, 11, 17, 21, 25, 27, 29
Week 12	19.1	The Idea of a Flux Integral	13, 15, 17, 19, 21, 27, 31, 33, 35, 50, 51
	19.2	Flux Integrals: Graphs, Cylinders and Spheres	5, 7, 11, 15, 17, 23, 30
Thanksgiving Break: November 21 – 25			
Nov 29	20.1	The Divergence of a Vector Field	3, 5, 7, 9, 11, 17, 19
Week 13		Review	
EXAM II: Thursday December 1, 6–7 pm, Fisher 135			
Dec 06	20.2	The Divergence Theorem	3, 5, 7, 15
Week 14	20.3	The Curl of a Vector Field	3, 5, 7, 9, 17, 26, 31
	20.4	Stokes' Theorem	1, 3, 7, 11, 25
FINAL EXAM: Wednesday December 14, 5:30–7:30 PM, M&M U115			