COLORADOSCHOOLOFMINES

MATH224A **Fall 2016**

Calculus for Scientists & Engineers III – Honors

Instructor: Gus Greivel

- Contact Information:
  Office: SH202 Phone: x3840 Email: ggreivel@mines.edu
- Office Hours: MWF 9:00 - 10:50, R 8:00 - 9:50
- Class Day/Time/Location: MWF 1:00-1:50 in AH 340 R 1:00-2:50 in CT 231
- Web Page/Blackboard link: blackboard.mines.edu

Instructional Activity: _4_ Hours Lecture _0_ Hours Lab _4_ Semester Hours

Course Designation: _X_ Common Core

Course Description:
Vectors and Multivariable Calculus, including partial derivatives, multiple integration and vector calculus.
Prerequisites: C or better in MATH112 or MATH122.

Text: I will be basing my lectures on Calculus: Early Transcendentals, 6th ed., Stewart, 2008. This is an older edition that should be available for purchase for no more than $20-$30 online. I also intend to make a copy of this text available outside my office.

Student Learning Outcomes:
At the conclusion of the class students will:

1. *Identify* the differences between single and multivariate differential/integral calculus and when applicable *explain* the consequences.
2. *Interpret* the operators of multivariate differential/integral calculus and use them to *solve* problems associated with summation, extreme values, constrained optimization and instantaneous rates of change.
3. *List* the operators of vector analysis, apply them to *solve* problems related to the fundamental theorem of calculus for vector-valued multivariate function and *justify* their *combination* with physical interpretations.

Grading Procedures:

Mid-term Quiz	20%
Final Exam:	20%
Discretionary:	60%
Total:	100%

90 - 100%	A
80 - 89%	B
70 - 79%	C
60 - 69%	D
Below 60%	F

Blackboard:
This course will be using Blackboard. To login go to blackboard.mines.edu. If you are officially enrolled in this course, you should be enrolled in the corresponding Blackboard course. Announcements and course documentation are all available through Blackboard. If you are having difficulty accessing your Blackboard account, you need to let your instructor know immediately. The website http://inside.mines.edu/Blackboard_1 contains additional information on Blackboard.

Homework:
In general, homework is due to my office by 5:00pm on the indicated due date, though I may choose, at my discretion, to collect work at other times. Late work is penalized one letter grade per-business day.

Exam Policy:
The date of the mid-term exam will be announced in class and on the web a minimum of two weeks prior to its delivery. Make-ups will only be issued in the event of excused absences (see the above absence policy). It is the student's responsibility to contact the instructor as soon as possible regarding the need for a make-up due to an excused absence.

Coursework Return Policy:
Worksheet solutions are posted on Blackboard (see above). In general, final exams are not returned to the student nor are solutions posted, but students may schedule an appointment to review their final exam with their instructor.

Absence Policy:
The website http://inside.mines.edu/Student-Absences outlines CSM's policy regarding student absences. It contains information and documents to obtain excused absences. Note: \All absences that are not documented as excused absences are considered unexcused absences. Faculty members may deny a student the opportunity to make up some or all of the work missed due to unexcused absence(s). However, the faculty members do have the discretion to grant a student permission to make up any missed academic work for an unexcused absence. The faculty member may consider the student's class performance, as well as their attendance, in the decision."

Disability Accommodations:
The website http://disabilities.mines.edu/accommodations.html outlines CSM's disability services. The AMS department requests that any student requiring accommodations contact the instructor via email or individual meeting within the first two weeks of class or within two weeks of receiving the accommodation.

Policy on Academic Integrity/Misconduct:
The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every students academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.
Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.
The complete policy is online at http://bulletin.mines.edu/undergraduate/policiesandprocedures/.

Recommended Practice Problems:
We will discuss in Studio…

Tentative Course Schedule and Important Dates:

Week of	Important Dates	Topics
Aug. 22nd	Classes Begin (Aug. 22)	Introduction and Review of Prior Calculus Topics Quadric Surfaces (12.6)
Aug. 29th		Functions of Two or More Variable (14.1) Limits and Continuity (14.2)
Sept. 5th	Labor Day (No Class Monday, Sept. 5) Last Day to Add/Drop without W (Sept. 6)	Partial Differentiation (14.3)
Sept. 12th		Linear Approximation (14.4) Multivariate Chain Rule (14.5)
Sept. 19th		Gradients and Directional Derivatives (14.6) Critical Values (14.7)
Sept. 26th		Lagrange Multipliers (14.8) Double Integrals over Rectangles (15.1)
Oct. 3rd		Iterated Integrals (15.2) Double Integrals over General Regions (15.3) Double Integrals in Polar Coordinates (15.4)
Oct. 10th		Applications of Double Integrals (15.5) Triple Integrals (15.6)
Oct. 17th	Fall Break-No Class Oct.17th-18th	Triple Integrals in Cylindrical Coordinates (15.7) Triple Integrals in Spherical Coordinates (15.8)
Oct. 24th		Change of Variables (15.9) Vector Fields (16.1)
Oct. 31st		Line Integrals of Scalar & Vector Fields/Work (16.2)
Nov. 7th	Last day to W-Cont. Students (Nov.13)	Fundamental Theorem for Line Integrals (16.3) Green's Theorem (16.4)
Nov. 14th		Divergence and Curl (16.5) Parametric Surfaces and Surface Area (16.6)
Nov. 21st	Thanksgiving Break-No Class (Nov. 25-27)	Surface Integrals of Scalar Functions (16.7)
Nov. 28th	Last day to W-New Students (Dec. 2)	Surface Integrals of Vector Fields/Flux (16.7) Stokes' Theorem (16.8)
Dec. 5th	Dead Day-No Class (Dec. 9)	Divergence Theorem (16.9) Review

List of Topics Covered:

Quadric Surfaces (12.6)
Functions of Two or More Variable (14.1)
Limits and Continuity (14.2)
Partial Differentiation (14.3)
Linear Approximation (14.4)
Multivariate Chain Rule (14.5)
Gradients and Directional Derivatives (14.6)
Critical Values (14.7)
Lagrange Multipliers (14.8)
Double Integrals over Rectangles (15.1)
Iterated Integrals (15.2)
Double Integrals over General Regions (15.3)
Double Integrals in Polar Coordinates (15.4)
Applications of Double Integrals (15.5)
Triple Integrals (15.6)
Triple Integrals in Cylindrical Coordinates (15.7)
Triple Integrals in Spherical Coordinates (15.8)
Change of Variables (15.9)
Vector Fields (16.1)
Line Integrals (16.2)
Fundamental Theorem for Line Integrals (16.3)
Green's Theorem (16.4)
Divergence and Curl (16.5)
Parametric Surfaces and Surface Area (16.6)
Surface Integrals of Scalar Functions (16.7)
Surface Integrals of Vector Fields/Flux (16.7)
Stokes' Theorem (16.8)
Divergence Theorem (16.9)