MATHEMATICS 2250
Ordinary Differential Equations and Linear Algebra
Fall semester 2004

Time: MTWF 7:30–8:20am EMCB 101 or MTWF 10:45-11:35am LS 101

Instructor: Professor Grant B. Gustafson[1], JWB 113, 581-6879.

Tuesday Lecturers: Ben Murphy, LCB 4th floor (no phone) and An Le, JWB 206, 581-7314

Office Hours: JWB 113, MWF 8:55-9:30am and 11:45-12:15. Other times will appear on my door card and on the internet due date page.

Telephone: 581-6879. Please use email whenever possible.

Email and web site: `gustafso@math.utah.edu` `http://www.math.utah.edu/~gustafso/` `murphy@math.utah.edu` `anle@math.utah.edu`.

Tuesday Lab: Please attend one or more times as advertised below,e.g., if your class is at 10:45, then you may attend 7:30 or later lab sessions. It is usual to attend two Tuesday sessions for 20 minutes each to obtain help on dailies, maple labs, take-home exam problems and sample midterm exams.

Tuesday 7:30-8:20 a.m.	EMCB 101
Tuesday 10:45-11:35 a.m.	LS 101
Tuesday 12:55-1:45 p.m.	EMCB 105
Tuesday 5:00-5:50 p.m.	LCB 219

Tutoring: The Math Department Tutoring Center is located in LCB, and it is open for free tutoring from 8 a.m. to 8 p.m. on M-Th, and from 8 a.m. to 2 p.m. on Friday. Some, but not all of the math tutors welcome questions from Math 2250 students. To see the times and specialities of various tutors, consult the web address `www.math.utah.edu/ugrad/tutoring.html`.

Texts:

Differential Equations and Linear Algebra, by C.H. Edwards Jr. and David E. Penney, Second Edition (the required text).

Differential Equations, Cliff's Notes series. Contains concise examples and readable explanations of topics found in the Edwards-Penney text.

Student Solution Manual, for the Edwards and Penney text *Differential Equations and Linear Algebra*

WWW documents for 2250 at web site `http://www.math.utah.edu/~gustafso/`. All are pdf or text documents that can be printed from `Netscape` or `MS explorer` web browsers. Author: G.B. Gustafson.

Prerequisites:

Math 1210 and 1220 or the equivalent. This is first-year Calculus, with a very brief introduction to linear differential equations. The old Math courses 111-112-113 of 1997-98 fulfill the requirement. In addition, background is required in planar curves, velocity and acceleration vectors from Physics 2210 or Math 2210, or their equivalent courses.

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[1]Pronunciation: In the phrase *Gust of Wind* change *Wind* to *Sun*

A passive knowledge of `maple` is assumed. The entire course can be done without `maple`, but all computer code examples are supplied in `maple` only. A good replacement for persons without computer training is a graphing calculator and Microsoft's `Excel` or the MathWork's `matlab`. To cooperate with the engineering programs on campus, some `maple` contact is required in the course work for 2250. The co-requisite is Physics 2210 (old 301), with actual use of physics minimal.

Persons without the passive knowledge of `maple` and `unix` may attend one of the *tutorials* on the subject offered during the first two weeks of the term. The instructor for these tutorials is Angie Gardiner, 585-9478, `gardiner@math.utah.edu`. The dates and times are printed on Angie's door MC 155A (building LCB). See also the tutoring web address cited above. Free tutoring is available in the LCB tutoring center 8:00 a.m. to 8:00 p.m. daily except until 6:00pm on Friday, closed weekends and semester holidays.

Course content:

This course is an introduction to linear algebra and differential equations in engineering and science. Chapters 1-7 and 10 in the Edwards-Penney text plus class notes and `www` documents will make up the course material.

Grading:

Final grades will be based on:

> Textbook problems, the major part of the **dailies**, about 118 scores.
>
> Three computer projects form the minor part of the **dailies**. Each project is counted like six (6) textbook problems, for a total of 18 scores, making 136 dailies.
>
> Written midterm examinations (3). Some portion of each midterm is take-home.
>
> An in-class 2-hour final examination that counts as two additional midterm scores.

Written In-Class Exams:

There are three (3) midterm exams. Some portion of each midterm is done outside of class. The outside work is due at class time on certain dates before the in-class exam. There is a 2-hour in-class final exam as scheduled by the university. The midterm and final exams are graded by G.B. Gustafson and the Tuesday lecturers (An Le and Ben Murphy).

Hand-written Dailies:

There will be 136 dailies due during the semester, including textbook problems and three maple labs. They will be graded by a staff of readers employed by Angie Gardiner.

Textbook problems:

Textbook problems to be submitted for grading are listed on the `gradesheet` for the course. Visit the web site for extra copies. The due dates for problems appear only on the web site and they are dynamically updated to reflect the reality of what was discussed in class. Generally, problems are submitted shortly after they are discussed in class.

All students must complete each textbook problem and submit their work in their own handwriting. Collaboration is permitted and encouraged on textbook problems in teams of not more than 2. You must submit a separate handwritten report with citation to the partner.

There are certain **rules** for writing up the textbook problems and the take-home portion of a midterm exam. A full accounting of the *format rules* contributed by students of 2250 appears on

the internet course page as *format for submitted work*. Kindly apply the ideas therein to your written work, both textbook problems and take-home midterm exam problems.

Take-home exam problems:

A portion of each of the three midterms is a take-home exam in at least four versions, to be completed and submitted by the due date published on the web site. The format rules apply strictly: what you submit is considered to be your very best work. It will be judged accordingly against the submissions of others.

Collaboration on take-home exam problems is not sanctioned. Tutors and lab assistants may answer questions, but they will not work the problems for you or certify correctness of your solution. Duplicate solutions will be considered a deliberate act of plagiarism.

In-class midterm exam problems:

A midterm sample in-class exam is supplied a few days before the in-class exam. Exam problems are modeled after the sample exam.

A midterm may also have a take-home component. Generally, take-home exam problems have `maple` content, making them unsuitable for an in-class exam.

Books, tables, notes and calculators are not allowed on exam day.

An in-class Midterm exam has different presentation rules, and none of the textbook problem rules apply in this case. Basically, the in-class exam is a first draft.

Computer projects:

There will be three computer projects assigned during the semester, related to the classroom material. Each project counts the same as 6 daily problems from the textbook, for a total of 18 scores on the dailies. They will be written by hand and use the software package `maple`. There is a Math Department Computer Lab in building LCB at which registered students automatically own accounts, and there are other labs around campus where `maple` is also available, for example at the College of Engineering. There will be *free* tutoring support for these projects (Tuesdays) and for your other course work as well. Drop-in tutoring in the computer lab in building LCB starts the second week of the semester.

Final exam:

Two hours are reserved for this written exam. As published by the university, the final exams are: 7:30 class: Tuesday Dec 14, 8-10am; 10:45 class: Monday Dec 13, 10:30-12:30. Both in the regular classroom.

The final exam is comprehensive. About one hour of the exam covers the last three weeks of the course. The remaining time covers all topics that appeared on the previous three midterm exams.

No notes, calculators, tables, books or aids of any kind are allowed on the final exam. Please bring pencils and eraser. Paper will be supplied.

Withdrawal:

It is the Math Department policy, and mine as well, to grant any withdrawal request until the University deadline. This promise also means that such a withdrawal requires no explanation. Withdrawals are always initiated by the registered student. All paperwork is the duty of the student. My job is the signature.

ADA statement: