AME 321–Differential Equations and Applied Mathematics
Fall 2001

Prof. Joseph M. Powers–Instructor
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7-484-7844 (office)
7-484-7862 (home)
Office hours: when available

Course web site: http://www.nd.edu/~powers/ame.321

Listserver address: ame321-01-fa01@listserv.nd.edu. When e-mail is sent to this address, the entire class will be receive a copy of the mail.

Course time and location: MW 9:30-10:45 AM, G.07

Prerequisites: Math 228

Catalog description: “Ordinary and partial differential equations, Fourier series, initial and boundary value problems, linear algebra and transformation techniques as applicable to engineering problems.”

Comments: This course will be a fundamental course in differential equations. The main text will be Boyce and DiPrima. Selected portions of my AME 561 course notes will be useful at times. A significant fraction of the homework will require the use of the computer, either for computational symbolic manipulation or numerical analysis.

Required Text


Background Reading

M. Sen and J. M. Powers, 2001, Lecture Notes on Mathematical Methods, (on the AME 321 web site, you may want to print Chapters 2, 3, 5, 8, and 9 which have extended background information and examples which may be useful).

Required Work and Grading

Late homework and missed examinations and quizzes will be assigned a grade of zero. *All* work must be submitted to receive a passing grade for the course. Exceptions will be made only with an an official written university excuse as well as the discretion of the instructor.
Exams will be closed book, closed notes and held in class. The final exam will be comprehensive. You can bring one A4 sheet with notes on both sides to the first exam, two to the second, and three to the final.

Homework will be assigned daily at the beginning of class. All homework will be graded and returned. Homework must be done on one side only of A4 engineering paper with no frayed edges. Multiple pages must be stapled. You should briefly restate the problem, give a sketch if helpful, give all necessary analysis, and place a box around your final answer. All plots must be computer generated, trimmed, and taped to engineering paper. Label all axes. Raw Mathematica, Maple, or Matlab output will not be graded. Neatness and effective communication are considered in grading as well as the final answer itself.

Short closed book, closed note quizzes will be given weekly in class.

A one page paper summarizing the contributions of a British mathematician is required. Your paper must include at least one pertinent equation and must be written using a \LaTeX X format. Proper grammar, spelling, format, and technical content will be required for a passing grade. Rewrites may be required.

A short review (one page maximum) of Dava Sobol’s short book *Longitude*, available in the library or most commercial bookstores, will be required. The review must be written using \LaTeX X format. Proper grammar, spelling, format, and technical content will be required for a passing grade. Rewrites may be required.

A short description (one page maximum) of your most eclectic and original experience, with restrictions noted below, in the United Kingdom is required. For this report, science and technology are off limits (with one minor exception, noted below), bar-room exploits do not qualify, nor does anything related to sports, shopping, or hedonism, and use of the words “awesome” and “cool” is prohibited. As this is still a class on differential equations, you must report one differential equation in your text. You can use artistic license in creating your equation. \LaTeX X formatting is required.

Intangible factors will be at the discretion of the instructor and include such things as class participation, intellectual curiosity, and attendance at informal and sporadic tours which I will try to organize from time to time.

Grades will be assigned based on students’ performance on examinations, quizzes, homework, and papers as well as intangible factors. Students’ grades may be penalized at the instructor’s discretion for more than two unexcused absences, pursuant to the policy of the Notre Dame London Programme. Pertinent information is as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Date/Time</th>
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<tbody>
<tr>
<td>Exam I</td>
<td>20</td>
<td>Wednesday, 19 September 2001</td>
</tr>
<tr>
<td>Exam II</td>
<td>20</td>
<td>Wednesday, 31 October 2001</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
<td>non-exam Wednesdays</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30</td>
<td>Tuesday, 18 December 2001, 9:30-11:30 AM, Gallery</td>
</tr>
<tr>
<td>Homework</td>
<td>12</td>
<td>every class period</td>
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<tr>
<td>Paper 1</td>
<td>1</td>
<td>Wednesday, 12 September 2001</td>
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<tr>
<td>Paper 2</td>
<td>1</td>
<td>Wednesday, 24 October 2001</td>
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<td>Paper 3</td>
<td>1</td>
<td>Wednesday, 5 December 2001</td>
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<tr>
<td>Intangibles</td>
<td>5</td>
<td>Throughout term</td>
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| Total         | 100   |                                             |

**Honesty Policy**

Academic honesty is expected. When confronted with an apparent violation, I will enforce the appropriate University regulations to the best of my ability. I will also try to make my expectations clear. By and large, though, these issues are out of my control and as such I do not seek out violations. Instead, I depend upon your basic integrity to prevent any problems.
In brief my expectations are as follows. I encourage you to freely discuss the homework amongst one another as you formulate your solutions individually. Your written work should represent your understanding of the problem. In practice this means copying (in whole or in part) another student’s homework, exam, computer program, or paper is not permitted. If you choose to discuss your work with a colleague, it should be a discussion in which one teaches another or both work to a mutual understanding. As a counter-example, it is not acceptable to give a friend your homework five minutes before class so that friend can copy your work. I also consider it unacceptable to copy work from a student who was in the class in a previous year.

In your written reports, be careful to correctly use quotation marks for words that did not originate with you. Paraphrasing should be held to a minimum, but if used, the paraphrased section should be specifically identified and unambiguously cited. It is not sufficient to simply list a reference but not indicate where a specific quotation or paraphrase was employed. In addition all sources used should be fully cited. As is done in the scientific literature, you should briefly acknowledge in writing any significant discussions or interactions you had regarding the work you submit. As a general principle, I do not accept the justification that you were not sure of my intentions. If you feel you may be in an ethical grey area, then you should consult with me before acting.