Course Rationale (from MTU web site): “A physicist often must address new problems in an area for which they have little or no prior experience. This course has physics majors take a step back and examine some of the common threads between different areas of physics and how they apply to thinking about, setting up, and solving problems in physics using results and understanding from their coursework, and hence to better prepare students to deal with new situations in the future.”

Text: Back-of-the-Envelope Physics (Johns Hopkins Paperback) by Clifford Swartz

Other suggested texts: “Street-fighting mathematics” by Mahajan; “Elements of Style” by Strunk and White.

Grading: based mostly on regularly submitted homework (such as the GRE exam problems) and also on class participation.

Objectives:

1) To learn to apply physics in unusual circumstances. To that end, various physics topics will be combined with reading of current articles from scientific journals, drawn deliberately from unfamiliar fields so that qualitative methods can be applied in unusual circumstances.

2) To prepare for the subject GRE in physics (you will work through at least 3 physics GRE tests)

3) To read a couple of journal articles and obtain background information with particular application to the next item (4):

4) Learn to pick graduate schools and potential advisors (and survive in graduate school; physics or another subject)

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