MA 23100 and MA 23200 - FINAL EXAM INFORMATION
Fall 2009

Final Exam schedules

Course	*Date*	*Time*	*Location*
MA 23100	December 17 (Thursday)	1:00 to 3:00 pm	PHYS 112
MA 23200	December 18 (Friday)	7:00 to 9:00 pm	MSEE B012

PHYS = Physics. MSEE = Materials and Electrical Engineering
You may refer to the campus map for their locations.

For MA 23100, there's a link ("Seating Arrangement") in the official course webpage which shows the area where your section will be sitting. Students will be one seat apart from each other.

If you arrive more than **20 minutes late** (from the time we start the exam), you will have to take an alternate exam with a 20 point penalty (which is waived if a documented emergency prevented you from arriving on time). If you're late by at most 20 minutes, you can still take the exam but with no extension. You also cannot leave the test venue within the first 20 minutes (in case you finish early).

Bring a photo ID to the final. You will need to code your PUID and Section No. on the scantron (to make sure your instructor receives your scores in a timely fashion). The exam will be worth 200 points and will consist of 24 multiple-choice questions. You will have 120 minutes. Only a one-line calculator (any brand) may be used. Calculators cannot be shared. Cell phones and PDA's cannot be used as calculators (they must be turned off and put away during the exam). **Only the scantron answer sheet will be graded**, so be very careful in coding your answer choices. No regrades will be allowed for miscoded or uncoded answer sheets.

There is no partial credit on the exam. However, you should show all of your work on every problem and circle your answer on the exam itself. In the unlikely event that anything happens to your scantron, the exam will be used as backup. However, note that no regrades will be allowed for miscoded answer sheets.

At the end of the exam, you will turn in both your scantron answer sheet and the exam itself. If all goes well, final exam scores and letter grade estimates will be available via the official course webpage Friday afternoon for MA 23100 and Monday afternoon for MA 23200. Note that the estimates are not official, and will only be given so you have an idea of your performance relative to the other students.

Alternate Exam

If you need to request an alternate final, please contact your instructor as soon as possible. The only guaranteed reasons for an alternate final without penalty are (a) three finals in one day, (b) two finals at the same time, (c) special ADA cases, (d) documented personal illness or (e) documented family emergency. In some cases, an alternate final may not be allowed at all. For reasons (a) and (b), a printout of your personalized exam schedule will be sufficient documentation.

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Formulas

You do not need to memorize the following formulas and facts. **If they are needed, they will be provided in the Final Exam questionnaires.**

MA 23100

- trigonometric identities:
  - $\sin(s+t) = \sin s \cos t + \cos s \sin t$
  - $\cos(s+t) = \cos s \cos t - \sin s \sin t$
- trigonometric function values of special angles:

Angle	$30^\circ = \pi/6$	$45^\circ = \pi/4$	$60^\circ = \pi/3$
$\cos t$	$\sqrt{3}/2$	$\sqrt{2}/2$	$1/2$
$\sin t$	$1/2$	$\sqrt{2}/2$	$\sqrt{3}/2$

- definition of the derivative: $f'(x) = \lim_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$
- derivatives of some trigonometric functions and corresponding antiderivative formulas
  - $\dfrac{d}{dx} \cot x = -\csc^2 x$
  - $\dfrac{d}{dx} \sec x = \sec x \tan x$
  - $\dfrac{d}{dx} \csc x = -\csc x \cot x$
  - $\displaystyle\int \csc^2 x \, dx = -\cot x + C$
  - $\displaystyle\int \sec x \tan x \, dx = \sec x + C$
  - $\displaystyle\int \csc x \cot x \, dx = -\csc x + C$
- definition of the definite integral: $\displaystyle\int_a^b f(x)\,dx = \lim_{n \to \infty} \sum_{i=1}^{n} f(x_i)\Delta x$ where $\Delta x = \dfrac{b-a}{n}$
- Newton's Law of Cooling: $T(t) = P_0 e^{-kt} + C$ where $P_0 = T(0) - C$

MA 23200

- Trapezoidal Rule for $\displaystyle\int_a^b f(x)\,dx$:

$$T_n = \frac{\Delta x}{2}\left[y_0 + 2y_1 + 2y_2 + \cdots + 2y_{n-1} + y_n\right]$$

  where $\Delta x = \dfrac{b-a}{n}$, $x_k = a + k\Delta x$ and $y_k = f(x_k)$.
- Method of Least Squares: The regression line for $(c_1, d_1), (c_2, d_2) \ldots, (c_n, d_n)$ is

$$y - \overline{y} = m(x - \overline{x})$$

  where $\overline{x} = \dfrac{\displaystyle\sum_{i=1}^{n} c_i}{n}$, $\overline{y} = \dfrac{\displaystyle\sum_{i=1}^{n} d_i}{n}$ and $m = \dfrac{\displaystyle\sum_{i=1}^{n} (c_i - \overline{x})(d_i - \overline{y})}{\displaystyle\sum_{i=1}^{n} (c_i - \overline{x})^2}$