If you would like to help future AMS 11A students and get paid for it

As a reader: Contact Dana Pierce
dana@soe.ucsc.edu
for an application form.

As a MSI tutor: Contact Charis Herzon
charish@ucsc.edu
You also need the students to apply to the job at the UCSC career center website: http://www2.ucsc.edu/iss/
Charis does not know how many positions will be available next quarter. It will depend on who is interested in returning. She writes to us “But it is always nice to have lots of high quality candidates.”

Exam #3 Problems
Teaching problems
Preparation problems
Performance problems

Action to Correct
?
Practice final to mimic actual final
Final 6 of 4 problems
3 hrs is 1 1/6 hours

UC Academic Council (23 Nov 09)
Head of faculty
Head of system wide committees
The Importance of Study Skills

The pace of UC courses is much faster than either high school or community college and may require that you further develop your study skills (check out what your College offers in this area).

• Keep up with the material.

• Start your homework as soon as possible, but no later than Tuesday.

• Start preparing for the exams at least a week in advance.

• Keep in touch with your TA and me if you are having problems. We want you to succeed.

Sections

Sections are not mandatory – but they are intended to help you succeed. In sections you will be reviewing the material by doing exercises and problems and may even get help with homework.

Grades will be determined as follows

- The average of your 6 highest homework scores: 20%
- Your highest midterm exam: 25%
- Your second highest midterm exam: 15%
- Your lowest midterm exam: 10%
- Your final exam: 30%

Letter grades will be determined as follows: F: <50%, D: 50-61%, C: 62-73%, B: 74-86%; A: >86%.

If you are taking the course P/NP, then you must earn a C or better for a P grade. Also, please note that you need a C or better to enroll in AMS/ECON 11B. Intangibles, such as improvement throughout the quarter, can help in borderline cases, especially at the C/D border.

There is no extra credit work in this course and no exceptions are made in the grading. So, for example, if you have been told that you need a B- or better to declare as an economics major, and you have concerns about earning the grade you want/need, then please come see me early in the quarter so that we can devise a study plan for you that will help you attain your goals.

Remember: I do not give grades, you earn them.

Evaluations will report your examination and homework scores, along with the class average and standard deviation. Comments from TAs about your performance will be added as appropriate.

Flat Law
Financial Aid for UC Undergraduates

- Financial aid and tax credits provided more than $1.7 billion to UC undergraduates in 2008-09

- 55% of undergraduates received $1 billion in grants and scholarships with an average award of $11,100

- One-third of undergraduates are low-income, Pell Grant recipients, more than any other comparable research university
Financial Aid Enhancements: 2009-10

- Augmentations to Cal Grants and UC grants to cover fee increases of lower-income students
- Pell Grant expansion raising maximum award by $619, from $4,731 to $5,350
- Tuition tax credit expansion raising maximum credit and raising income ceiling
- Introduction of [Blue and Gold Opportunity Plan ensuring systemwide fees coverage]
Financial Aid Enhancements: 2010-11

• Continue Undergraduate 33% return-to-aid policy and Graduate 50 % RTA

• Augmentations to Cal Grants to cover fee increases

• Further Pell Grant expansion raising maximum award by $200 to $5,550

• Expansion of Blue and Gold Opportunity Plan to include students with family income up to $70,000
Estimated Change in Undergraduate Net Fee Costs
2009-10 and 2010-11, relative to 2008-09

Change From 2008-09 Net Fees

$0 $0

($291) $359 $1,312 $1,509 $1,247 $3,176

Below $60K $60K to $90K $90K to $120K $120K to $180K Above $180K

Parent Income

Display 17
If \( f(x) \) is continuous at \( x = a \) and changes concavity \( f''(x) \) goes from positive to negative or vice versa \( f''(x) \) at \( x = a \). Then \( a \) is called a point of inflection and \( f''(a) = 0 \) or does not exist.

\[
f(x) = \frac{1}{3}x^3 - ax \quad a < 0
\]
We can concavity checking to our curve sketching procedure.

1) Find $f(0)$ and any any give away values

2) Find $\lim_{x \to \pm \infty} f(x)$ These are called horizontal asymptotes

3) Find values of $x$ where $f(x) \to \pm \infty$ These are called vertical asymptotes

4) Find $x$ where $f(x) = 0$ §13.5

5) Find all critical points $f'(x) = 0$
   check for local maxima $f''(x) < 0$
   for minima $f''(x) > 0$
   and points of inflection $f''(x) = 0$

§13.4 "the Second derivative test"
6) "Connect the dots"

Simple example: \( f(x) = \frac{2x}{x-3} \)

1) \( f(0) = 0 \)

2) \( \lim_{x \to 0} \frac{2x}{x-3} = \lim_{x \to 0} \frac{2}{1-\left(\frac{3}{x}\right)} = 2/1 = 2 \)

\( \lim_{x \to \infty} \frac{2x}{x-3} = \lim_{x \to \infty} \frac{2}{1-\left(\frac{3}{x}\right)} = 2 \)

2) is the horizontal asymptote in both directions

3) When does \( f(x) \to \pm \infty \)?

If \( x \uparrow 3 \), \( f(x) \to -\infty \)

If \( x \downarrow 3 \), \( f(x) \to \infty \)

\( x \uparrow 3 \) means \( x \) is increasing towards 3 (\( x<3 \))

\( x \downarrow 3 \) "decreasing" (\( x>3 \))
4) Solve \( f(x) = 0 \)

\[
2x - 3 \leq x = 0
\]

5) \( f(x) = \frac{2x}{x-3} \)

\[
f'(x) = \frac{2(x-3) - 2x(1-0)}{(x-3)^2} = \frac{2x - 6 - 2x}{(x-3)^2} = -\frac{6}{(x-3)^2}
\]

There are no critical points. Let's check on concavity.

\[
f''(x) = \frac{-6}{(x-3)^2} = -6(x-3)^{-2}
\]

\[
f''(x) = (-6)(-2)(x-3)^{-3}
\]
So \( f''(x) = \frac{12}{(x-3)^3} \)

If \( f(x) < 3 \), \( f''(x) < 0 \) \( \Rightarrow \) concave down

If \( x > 3 \), \( f''(x) > 0 \) \( \Rightarrow \) concave up
About fisheries economics \[ \text{[Renewable resource economics]} \]

Next year's population size (tons) = This year's population size (tons) + Production of new biomass (tons) - Harvest

B = biomass this year

Production of new biomass \( p(B) = rB \left(1 - \frac{B}{K}\right) \)

\[ \frac{dB}{dt} = r - \frac{2B}{K} \]
\[ P(B) = rB \left(1 - \frac{B}{K}\right) \]

To find the location of the peak, set \( \frac{dP}{dB} = 0 \)

\[ P(B) = rB - \frac{rB^2}{K} \]

\[ \frac{dP}{dB} = r - \frac{2rB}{K} \]

\[ \frac{dP}{dB} = 0 \implies r = \frac{2rB}{K} \implies B = \frac{K}{2} \]
When $B = K/2$, the sustainable harvest (in a perfect world) is:

$$\frac{rK}{4}$$

This is called maximum sustainable yield (MSY).

In the US, this is a constraint constraint of fisheries management, not a target.

(not so in the rest of the world)

If $B = b$, the sustainable harvest is:

$$p(b) = rb\left(1 - \frac{b}{K}\right)$$

production when $B = b$. 

\[\text{Diagram:}
\begin{array}{c}
B = b \\
B = K/2 \\
B = \text{max}
\end{array}\]
Characterizing the revenue when we hold the population size at $B = b$.

\[
\text{Income} = \text{Harvest} \times \text{price} = rb(1 - \frac{b}{K})z.
\]

\[
\text{Cost} = c_0 + c_1b.
\]

H. Scott Gordon (J. P.R. 1954)

\[
R(b) = rb(1 - \frac{b}{K})z - (c_0 + c_1b).
\]

This is the revenue when the population is held at size $b$.

\[
R(b) = rb - \frac{rb^2z}{K} = c_0 - c_1b.
\]
To maximize net revenue set $dr/db = 0$

$$R(b) = rzb - rb^2z - \frac{c_0 - c_1b}{k}$$

we set this equal to 0

$$rz - \frac{(rz)}{k} 2b - 0 - c_1$$

maximum economic yield

$$rz - c_1 = \frac{2rz}{k} b_{mey}$$

$$b_{mey} = \frac{k}{2rz} (rz - c_1)$$

$$= \frac{k}{2} \left(1 - \frac{c_1}{rz}\right)$$