

**Economics 3110:** Econ 3110 is an alternative to Econ 3010 aimed at students who are strong in mathematics and economics. The course is especially recommended for students who are considering the possibility of graduate study in economics or finance.

We cover the same material as 3010 but make more use of mathematics, so as to treat the subject in greater depth. If you dislike math or you don't enjoy solving problems, this course is not for you. We have a lot of material to cover, so you should expect lectures to proceed at a brisk pace. To prepare well for classes, **read the preliminary versions of the class slides, which will be available on the class website.**

Most students who take it agree that 3110 is more challenging than 3010 and most of those are glad to have chosen it, but there are certainly some who regret their choice. In my experience, students who have excellent grades in 2010 and their calculus classes tend to do similarly in 3110 but students whose past performance is not as strong are more likely to find 3110 a struggle.

**Grading:** I realize that the group who take 3110 tend to be better students than average and so there are usually substantially more A grades given in 3110 than in other classes of the same size.

**Prerequisites:** The prerequisites for the class are two semesters of calculus and Economics 2010. Some students have told me it is helpful to have taken Math 2310, or to be taking it concurrently with Econ 3110, but it is not a prerequisite.

**Adding in:** If you would like to add into 3110, be sure to attend all meetings of class and do the required assignments. Be sure to take the required readiness test at a meeting of the discussion section in the first week.

**Readiness Test:** In the first week, (at the first meeting of the discussion sections) the TA will administer a readiness test. This will test your background in math (through differentiation and maximization) since you will need these mathematical skills during the semester, and maybe some basic ideas from Econ 2010. If you are enrolled in the class and you do badly on this test, I would strongly advise you to switch to 3010 or wait a year and upgrade your math skills before trying 3110. Experience suggests that some students will drop the class, and, if SIS lets me, I will enroll students from the waiting list on the basis of their performance in the test, because this indicates who is best prepared for the course.

Here are some math topics that will be emphasized in the test:

Differentiation of simple functions, and of sums, products, and quotients of functions

Differentiation of composite functions using the chain rule.

Using differentiation to find maxima and minima (including first-order and second-order conditions).

Sample questions:

(1) Find the derivative of function  $f$  if  $f(x) = \ln(e^x + x^2)/x^3$

(2) Find all maxima and minima of the function  $f$  if  $f(x) = (\ln x)/x$   
(Note that  $\ln x$  is the logarithm of  $x$  to the base  $e$ )

The test may also include some questions that use fundamental concepts from Econ 2010 (like profit maximization, perfect competition, opportunity cost etc.). There may also be some more challenging, and open-ended questions. You can't really prepare for these, but they are aimed at getting an idea of your level of creativity and insight, and how well you can apply your knowledge in novel situations. Don't assume that, just because you don't have a very good idea about how to answer a question, you should give up. Instead, you should try to provide whatever insights you can or suggestions about how to go about dealing with the question, even if you are unable to answer it.

**Should I take 3010 or 3110?** This is a tough question, and the answer depends (of course) mainly on *your* own personal background, goals etc. To help you decide whether you should take 3110, I have appended below all answers from recent course evaluations to the question: "Would you recommend this course to others? Why or why not?"

Notice the range of opinions: Most students who addressed the issue feel that you should have a solid background in calculus (a view I would agree with) but, in one student's opinion, (which I honestly don't understand) "we didn't seem to use any math at all anyway." Part of what makes teaching fun and challenging is the wide variety of backgrounds students have and the wide variety of reactions to the same material.

**Question: Would you recommend this course to others? Why or why not?**

Answers:

Yes, I felt that I learned a lot, and that the professor was very good at communicating the material

Yes. It's very informational.

Yes, overall it was definitely a good class. I'm not sure if I'd recommend it over 3010, simply because we didn't seem to use any math at all anyway.

Yes I would recomend this class to others who are interested in majoring in Economics. I enjoyed the class very much.

Yes, because the information is very useful and the professor is very knowledgable.

not unless you are very good at math and econ

Yes I would highly recommend the teacher to any student.

yes. Very interesting presentation of microeconomics.

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oh hell no, nobody knows any difference between 3010 and 3110, so why would you ever subject yourself to such pain. I could have gotten an A+ in 3010 and I may not even get a B in this course

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i don't know

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yes, because it's challenging but the professor realizes it and do not kill students' GPA. It's a good exercise for your brain but at a very low cost in grades

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Yes. The math was not difficult if you've had sufficient calculus. Also, the class size is small and Engers is a great professor.

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Yes. I feel that it is very valuable for those who want a good grasp on key economic concepts.

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Yes, I thought many of the topics were pretty interesting.

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No, I don't see a reason why anyone should take this class over 3010 unless they don't care about their GPA or are brilliant.

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Yes, I would recommend the course, but not to those who are looking for an easy class or who don't like the math part of economics.

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Absolutely. A faster paced version of 3010 that really makes sure one understands the material. Perhaps the grade might be lower than desired/expected, but the knowledge will remain.

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yes; very educational

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yes

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I am not sure that the added difficulty really translated into added knowledge. I would reccomend it to prospective econ majors.

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only if they're good in math

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yes, it is the class that is most interesting and valuable that i have taken at this school

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Definitely! But I would warn them that it uses some calculus. Though I did not find this class overly difficult, some others complained about the difficulty... but it's supposed to be harder than 3010, so students should know that going in to the course.

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yes, it is tough but the class is worth it in the information that is in it.

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Yes, you can learn a lot in this class.

Yes

yes, great mathematical and economic class

if they are smart, yes. otherwise, no.

Yes, I would. I think this course is very interesting and thought-provoking, despite being challenging. A student should expect to internalize fully the concepts taught in course. Therefore, I'd recommend the course only to those who are serious about learning economics.

Yes, to those who are interested in taking more economics courses. Need to be confident in math ability.

yes only if you're calculus / mathematical knowledge is very high

I would say any student with a good math background would find this class a lot more interesting than 3010.

yes, to other engineers because the math is easy to understand

yea... very knowledgeable course.

maybe. I thought that it was too hard for me, and I might have done better in 3010, despite really liking math, etc.

I recommend this course to anyone who wants to see a rigorous rather than a qualitative presentation of economics, or who is considering further study in economics and wants to decide if the field is right for them. Calc III is very helpful, though, both for learning the material and understanding where it comes from.

I recommend this course to any student, planning to pursue serious study in Economics. It is challenging, but in a positive way, and a good student has a better chance of getting a good grade in ECON 3110 than ECON 3010. ECON 3110 with Mr. Engers is especially intellectually stimulating and rewarding.

For a math mind that enjoys problem solving and econ-type theory (not just application), the course is perfect.

Yes, if they are particularly interested in econ, particularly good in math, or possibly considering Econ DMP or econ grad school.

Only if they wanted to pursue further economics, 3010 is an easier course especially for students without a strong mathematical background

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Yes, challenging and interesting.

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yes, if you want a math-heavy economics background

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Yes, because I want everyone to know game theory

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Absolutely. It gives one great practice with a mathematically rigorous economics course, and provides a broad and great theoretical foundation for future courses.

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For students interested in a more challenging intermediate micro class who have good math intuition. High levels of math preparation are not necessary, just good math intuition.

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If you enjoy math and want to go more in depth on the mathematical concepts behind economic theory, I recommend it. If you do not enjoy math, do not take it.

But I should say that the mathematical part of the class is the easier part.

Understanding the economic concept is the hardest, in my opinion.

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yes

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yes

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yes

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Yes, but only if you're really interested in economics and like math.

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yes, it was good

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maybe - the person would have to be very passionate about economics and probably should have taken 2010 the previous semester

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Yes -- provides a great foundation for further work in microeconomics.

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Yes, if they are on solid ground mathematically.

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Only if they are ready for the challenge.

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Yes, the course was stimulating and really gave students an idea of what higher level economics would be like. Even though it just scratched the surface, it did a good job of representing things.

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Yes, but only if they are prepared for a challenge and are mathematically capable.

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Yes, anyone who knows calculus and enjoyed an intro econ class should take this. The problem solving techniques could be useful in many fields.

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Yes, but only if they think the math will help them a great deal in understanding Microeconomics.

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yes, it was very useful for econ knowledge

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yes, though it may be intense to some of the students, it's a worth taking course after all

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very much more, you learn so much more material in greater depth than what I've heard about the 3010 curriculum

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yes, it is a great taste of what mathematical economics is really like.

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Only to those very serious about understanding economics, and in a mathematical sense. And certainly not to anyone uncomfortable with calculus.

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yes I would, because it provides an important mathematical foundation for further economic studies

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yes - it is both challenging and thought-provoking

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Of course I would recommend it - but only to those with a strong interest in both economics \*and\* math. I suppose I'd be ambivalent about recommending it to slackers like me.

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Absolutely not. The class simply moves too fast, and it doesn't seem like he listens to people when they tell him to slow down (or tell the TA to tell him to slow down). I would advise other people to just take Econ 3010.

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Yes, because I think it has more to offer than the alternative, and is worth the added difficulty. The math wasn't really very hard.

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Absolutely. Very interesting material. Very clean approach. Clear instruction. Not more non-math folks, though. A must if you want to do graduate work.

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yes, it is a more challenging but better rewarding alternative to 3010.

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yes, regardless of the fact that you might do worse here than in 3010, i believe that this course expands more on the subject than 3010 ever will. Hence, you end up with a better basis for taking classes that require 3010/3110 as prereq

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Yes, if she/he wants to pursue a phd in economics

absolutely. to anyone who love math and challenges.

yes for those interested in gaining a deeper understanding of the underlying economic and mathematical concepts

yes, it was very educational and the professor was fair and well spoken

no - doesn't have much more over 3010, except the test questions are very hard and focus on pedantics

yes

yes, there is a lot of math but it brings the economic principles from theoretical to reality.

Yes, it's rigorous but worth it.

Yes. I learned a lot.

yes, i think it is better than 3010 would have been

Not to most people I know. I guess I wanted a challenge. It was probably a mistake.

yes = i would encourage anyone wishing to challenge themselves with a slightly harder version of intermed micro to do so, as i had a positive experience as rated above. also, i would recommend that others take a class from mr. engers, again for the reasons outlined above

Yes

No. I feel like I was too confused by all the depth of mathematic material and missed out on firmly grasping the broader important concepts that I probably would have gotten easier in 3010.

Yes, it is difficult but I feel it gives even more value to economics understanding the underlying mathematics and how the different numbers and graphs are created.

Yeah, I felt I have learned alot but took a while for me to grasp the concepts.

to people who have strength in math.

Yes, it was both interesting and challenging

Yes. This course challenges students without being too overwhelming. Anyone with a strong interest in economics should definitely take this course.

Yes, it's a hard but rewarding course and perfect for Econ majors that would take it seriously

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not sure. its really hard but insanely interesting and informative

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Yes, but with a caveat. This has probably been the best course that I have taken at UVA, and I have thoroughly enjoyed it. That being said, I also find economics fairly fascinating and did not mind putting in 4-5 hours on many problem sets, and I had a strong math background. Without those two things, this class might be too much for someone.

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Yes. It's a good foundation class.

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I'll highly recommend this course to my friends who are interested in digging into the topic of economics.

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Only if they are willing to spend a great amount of time on the course and are somehow naturally gifted in mathematical econ

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Yes, I will.

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Absolutely. Anyone with an interest in Econ should take this course.

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Hell yeah

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Yes.

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yes

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Yes -those who like a challenge will enjoy the difficult problems that require careful thinking.

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no. the mathematical aspect is unnecessary.

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Of course!

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Not unless they have a strong math background

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yes if you are okay with a very difficult class

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Yes, very challenging and enlightening.

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I would recommend this to anyone who can tolerate math. This course combined math and economics which are two of my favorite subjects and took what I learned from economics in high school and effectively took it to the next level.

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Yes, the math in the course is interesting



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Yes, material is very useful.

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Yes, if you are very gifted at math and econ and want a challenge

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Oh yeah. My favorite course at UVA thus far

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Yes -- great introduction to applying calculus concepts to build a foundation in microeconomics. Challenging, but very fair.