

MATH PLACEMENT INFORMATION FOR NEW STUDENTS

August 2011

In general, transfer students, very advanced students and students interested in research opportunities in MATH should speak to a MATH advisor. An introductory meeting will be held in the first week of classes regarding VIGRE, a program involving undergraduate research in math (see <http://math.rice.edu/VIGRE/>).

All the Science/Engineering majors require a number of calculus courses. By "calculus" we mean single-variable calculus, sequences and series, ODE's (ordinary differential equations), and multivariable calculus. Therefore the following sequence is quite common. Advice on where to start in this sequence is contained later in this document. F=fall, S=spring.

Science-Engineering Calculus Sequence:

MATH 101 - Single Variable Calculus I	(3 hours)
MATH 102 - Single Variable Calculus II	(3 hours)
MATH 211 - ODE's and Linear Algebra	(3 hours)
MATH 212 - Multivariable Calculus	(3 hours)

These four courses should be taken in sequence, although 211 and 212 are relatively interchangeable. Each of these courses is offered every semester, but the choice of times is limited in the "off" semester.

Honors Calculus Courses:

MATH 221 - Honors Calculus III (F)	(3 hours) Prof. Jones (2011)
MATH 222 - Honors Calculus IV (S)	(3 hours) Prof. Jones (2012)

These courses stress theoretical aspects of multivariable calculus, although they also contain a considerable amount of problem solving. The MATH department encourages students to consider these courses if they have a strong math background and are either considering a major in an area with a substantial math component (such as CAAM, STAT, ECON, CS, ECE, PHYS), or just enjoy a challenge and want to go beyond learning to solve problems. Successful completion of 221 and 222 satisfies major requirements for MATH 212, but not for MATH 211. Students may not receive University credit for both 212 and 222, but it is possible to receive credit for both 212 and 221. Moreover, honors students are allowed to take 211 for credit. Most students who take 221-222 also take MATH 211.

Other Calculus Courses (for Distribution):

MATH 111 - Fundamental Theorem of Calculus (F)	(3 hours)
MATH 112 - Calculus and Its Applications (S)	(3 hours)

These courses emphasize problem solving, and do not go as far as 101-102. They are not intended for science or engineering majors, but a student may take 111, 112, and 102 (or 111, 101, and 102).

More Advanced Courses

Students who have already taken some or all of the above courses should also consider the following courses. For even more courses see the general announcements. Speaking to a MATH advisor may be the best way to decide which course to take.

MATH 321	Intro. to Analysis I (F)	Prof. Semmes (2011)
MATH 354	Honors Linear Algebra (F)	Prof. Cochran (2011)

Students who have taken multivariable calculus or differential equations should consider MATH 354 if they are interested in abstract math and might possibly be a MATH major or double major. This would serve as a first class wherein one is trained in and required to prove mathematical statements. If you are a first-year student, you should obtain permission of Prof. Cochran to enroll in Math 354. MATH 365 can play a similar role. You must obtain consent of Prof. Semmes in order to enroll in 321.

Registration:

It is quite important that you enroll in the course for which you are best suited in light of your previous calculus instruction. There are several guiding principles you may find helpful. *We are convinced that most science-engineering freshmen should skip at least MATH 101.*

1. **Basic principle:** *If you want to take calculus, you should enroll in a course as advanced as you can possibly handle.* If you find you are in over your head, you may easily drop down to a more elementary course. (A transition in the other direction is obviously much more difficult to manage.)
2. **No calculus background at all:** You should begin with MATH 101 or 111.
3. **Advanced placement credit:**
 - a. Grade of 4 or 5 on AB test. You have credit for MATH 101 and you may start with MATH 102.
 - b. Grade of 4 or 5 on BC test: You have credit for MATH 101-102 and you may start with MATH 211 or 212. You should consider MATH 221 if you love math.
4. **No advanced placement credit:** You may have taken some calculus, however, and probably should enroll in a course beyond MATH 101. Consult with a Mathematics professor for advice.
5. **Transfer credit from another university:** Consult with Prof. Jones for advice.
6. **Have taken Multivariable calculus (but might not have credit):** Talk to a MATH advisor. You should strongly consider MATH 221-222 (see the discussion on the first page).

Tentative Texts (2011):

MATH 101-102-111: Stewart, Calculus Early Transcendentals, 6th Ed.

MATH 211: Polking, Boggess & Arnold, Differential Equations, 2nd Ed.

MATH 212: Marsden & Tromba, Vector Calculus, 5th Ed.

MATH 221: Purchase book from Prof. Jones.

MATH 321: Rudin, Principles of Mathematical Analysis, 3rd Ed.

MATH 354: Friedberg, Insel & Spence, Linear Algebra, 4th Ed.

MATH 355: Leon, Linear Algebra with Applications, 8th Ed.

MATH 365: Niven, Zuckerman & Montgomery, An Introduction to the Theory of Numbers, 5th Ed.

Warning: (especially Engineering Majors):

You need to be aware that the various engineering departments require their majors to have a minimum number of credit hours in Mathematics. If you skip MATH 101 but have no credit for it, for example, you probably will later have to take a Mathematics course to make up for the missing credit hours. Before you register you must consult with your engineering department to understand its Mathematics requirement.