

MATH PLACEMENT INFORMATION FOR NEW STUDENTS**August 2017****Science-Engineering Calculus Sequence:**

All Science/Engineering majors require a number of calculus courses. These courses should be taken in order, although 211 and 212 are relatively interchangeable. Advice on where to start in this sequence is contained later in this document. Each of these courses is offered every semester.

MATH 101 – Single Variable Calculus I	(3 hours)
MATH 102 – Single Variable Calculus II	(3 hours)
MATH 211 – ODEs and Linear Algebra	(3 hours)
MATH 212 – Multivariable Calculus	(3 hours)

Honors Calculus Courses:

MATH 221 – Honors Calculus III (F)	(3 hours) Prof. Jones
MATH 222 – Honors Calculus IV (S)	(3 hours)
MATH 238 – Honors ODEs (F)	(3 hours) Prof. Damanik

The Mathematics 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 (e.g., CAAM, STAT, ECON, CS, ECE, PHYS), or just enjoy a challenge and want to go beyond just learning to solve problems. MATH 221/222 stress theoretical aspects of multivariable calculus, although they also contain a considerable amount of problem solving. MATH 238 covers the same material as in Math 211, but with more of an emphasis on theory. All of these courses will teach students how to prove mathematical statements. It is not possible to receive credit for both MATH 211 and 238, or for both MATH 212 and 222, but it is possible to receive credit for both 212 and 221.

The MATH BA degree requires completion either of the sequence 211-212 or the sequence 221-222. However for other majors, successful completion of 221 and 222 satisfies requirements only for MATH 212, but not for MATH 211. Moreover, honors calculus students are allowed to take MATH 211 for credit. Most students who take 221-222 will also take MATH 211 or MATH 238.

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)	TBA
MATH 354	Honors Linear Algebra (F)	Prof. Várilly-Alvarado
MATH 355	Linear Algebra (F)	Dr. Calabrese
MATH 365	Number Theory (F)	Prof. Boshernitzan
MATH 499	Math RTG Seminar (F/S)	Dr. Berg, Dr. Etropolski

Students who have taken multivariable calculus should consider MATH 354 if they are interested in abstract math and might be a MATH major or double major. Among other things, Math 354 serves as a first class where students learn to prove mathematical statements. Math 365 can only be taken by students who have had some prior exposure to proofs, and Math 321 only by students with substantial prior exposure to proofs. If you are a first-year student, you should obtain consent from the instructor of record in order to enroll in MATH 321, MATH 354, or MATH 365.

MATH 499 is a non-traditional, one-credit class that offers a research experience for undergrads. In general, transfer students, very advanced students and students interested in research opportunities in MATH should speak to a MATH advisor.

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.

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 with the approval of your instructor. (A transition in the other direction is much more difficult.)
2. **No calculus background at all:** You should begin with MATH 101 or 111.
3. **Advanced placement credit and International Baccalaureate credit:**
 - a. AP Grade of 4 or 5 on AB test. You have credit for MATH 101 and you may start with MATH 102.
 - b. AP 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 and/or MATH 238 if you love math.
 - c. IB Mathematics (HL): D3 – You have credit for MATH 101 and you may start with MATH 102
4. **Some calculus but no advanced placement credit:** If you have taken some calculus, you probably should enroll in a course beyond MATH 101. Consult with a MATH professor for advice. *We are convinced that most science-engineering freshmen should skip at least MATH 101.*
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).

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