

MATH PLACEMENT INFORMATION FOR NEW STUDENTS

August 2019

Science-Engineering Calculus Sequence:

All Science/Engineering majors require some calculus courses. These courses should be taken in order, although 211 and 212 are 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 – Ordinary Differential Equations | (3 hours) |
| MATH 212 – Multivariable Calculus | (3 hours) |

Honors Calculus Courses:

| | | |
|--|-----------|---------------|
| MATH 220 – Honors Ord. Diff. Equations (S) | (3 hours) | Prof. Damanik |
| MATH 221 – Honors Calculus III (F) | (3 hours) | Prof. Jones |
| MATH 222 – Honors Calculus IV (S) | (3 hours) | |

The Mathematics department encourages students to consider the honors calculus 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, MTEC, COMP, ELEC, 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. Similarly, Math 220 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 220, 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 of either the sequence 211/220-212 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. Math 221-222 students are allowed to take Math 211/220 for credit.

Other Calculus Courses (for Distribution):

| | | |
|----------|--|-----------|
| MATH 111 | Calculus: Differentiation and its Applications (F) | (3 hours) |
| MATH 112 | Calculus: Integration 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 (on the next page). Speak with a Math advisor to decide which would be the best fit for you.

| | | |
|----------|-----------------------------|------------------------|
| MATH 321 | Intro to Analysis I (F) | Prof. Lukic |
| MATH 331 | Honors Real Analysis (F) | Prof. Semmes |
| MATH 354 | Honors Linear Algebra (F/S) | Prof. Várilly-Alvarado |
| MATH 355 | Linear Algebra (F/S) | Prof. Orcan |
| MATH 365 | Number Theory (F) | Prof. Wang |
| MATH 499 | Math RTG Seminar (S*) | Dr. Frei, Dr. Weiler |

*Tentative

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, 321, and 331 can only be taken by students who have had some prior exposure to proofs. First-year students should obtain consent from the instructor 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:

You should 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: *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: the registrar's office allows dropdowns in calculus (where you drop, e.g., Math 102 and add Math 101) as late as the 7th week of the semester. 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, or IB Mathematics (HL). You have credit for (the equivalent of) Math 101 and you may start with Math 102.
 - b. AP Grade of 4 or 5 on BC test: You have credit for (the equivalent of) Math 101-102 and you may start with Math 211 or 212. You should consider Math 221 and/or 220 and/or 354/355 if you love math.
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 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:** Talk to a math advisor. You should strongly consider Math 221-222 (see also the discussion above).

Note: If you know the material for a course but do not officially have credit, it might be possible to skip it even if your major requires the course. Many departments allow you to skip a basic math requirement and take another math class in its place (e.g., a major requires 101 and 102, but you take 102 and 212). You should consult with your department before registering to understand its particular mathematics policies and requirements.