

Calculus at Clarkson — First-year success

Why Calculus?

Students in engineering and most sciences take *Calculus I* (MA131) and *Calculus II* (MA132) in the freshman year. It must be taken with or before Physics for these students. More importantly, this foundational material is needed to understand many higher-level courses. Some of our non-technical majors take a first year sequence of *Introductory College Mathematics* (MA180) and *Basic Calculus* (MA181). Calculus is important! We are eager for all students to learn the material and to do well in the course of instruction. Naturally, good preparation and support are key ingredients to success.

Before coming to campus — Calculus Readiness Assessment

In May, a diagnostic math assessment is requested of all incoming first-year science and engineering students, as well as other students considering a double major in these areas or those seeking AP math credit. The evaluation uses a web-based platform to deliver that assessment to the students. Data from that survey, along with other diagnostic surveys regarding physics concepts and spatial reasoning, are used to help us advise the student on appropriate course selection.

Based on their individual performance, students are advised (by letters to students and parents) as to whether they need further practice during the summer to be ready for the transition to first year calculus. A few students may need some course work, but many simply need to sharpen (or keep sharp) their skills in order to have a good chance of succeeding. Performance on this test will also be used to validate requests for AP or transfer credit in Calculus.

Support during the pre-admission summer

The Math Department offers three different programs during the summer that are aimed at providing some additional boost (if needed) to help students in the transition from High School Math to College Math.

- On campus regular summer courses (5 weeks, last week in June through July)
 - 5 days a week, 90 minutes per day
 - (Option 1) Introductory Mathematics (MA030) meant to help students in transitioning to MA180
 - (Option 2) Pre-calculus (MA031) meant to assist in transition to MA131.
 - Offered free of charge to local students who can commute to campus on a daily basis, as no campus housing is available.
- CU-Math: a web-based, guided review meant to maintain (or re-establish) proficiency in high school mathematics.
 - Runs end of June through mid-august
 - Materials are all available on line, so very flexible in scheduling

- Uses a combination of instructional video and online math homeworks.
 - Designed to “keep-it-fresh” with respect to underlying skills.
 - Flexible time commitment based individual student’s assessed needs.
 - No charge.
 - *Historically, students actively participating in this program have a higher success rate in Calculus I.*
- Springboard: An on-campus refresher that takes place during the 9 days prior to the start of fall semester.
 - Starts mid-August
 - Reviews essential topics from algebra, trigonometry and geometry.
 - Allows you to move into your regular dorm room early and to acclimate to campus before fall classes begin.
 - Runs Monday-Saturday, approximately 4 hours per day.

Students are encouraged to take advantage of the opportunities that best fit their needs and circumstances.

Additional coursework support for Calculus I students

Our Calculus program is built around our main cohort of students in MA131.

- **Main Course — Calculus I (MA131).** This course is delivered as three lecture hours per week with regular faculty, with a 4th class period in a small group setting, working with a graduate TA.
- **Support Course — Co-Calculus (MA041).** This course is delivered by a senior graduate student, meets two times per week, and provides *just in time review* on materials that was taught in high school, but for which the student might not have current mastery of that topic. It is completely integrated with the calculus course, such that the supporting topic (in co-calculus) is pre-requisite background for the upcoming material in MA131.

Some of the students do not need the support of MA041, and demonstrate that they have the necessary proficiency on our *ABC Test*. The ABC test is our way to ensure that students have the fundamental skills in algebra and trigonometry that are necessary for success in STEM courses. Although the skills are “basic” in that they come from pre-college coursework, we ask the students to achieve a high level of proficiency and accuracy. The ABC tests is offered multiple times throughout the semester, and once a student demonstrates mastery, their attendance in MA041 is optional.

Questions

For additional information: <http://www.clarkson.edu/math/>

Or you can reach us at:

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