College of Creative Studies
Mathematics

Overview

The mission of the College of Creative Studies (CCS) is to provide curious, talented and imaginative undergraduate students the intellectual environment that allows them to quickly undergo the transition from consumers of knowledge to colleagues in the act of human creativity in the arts and sciences.

The Mathematics program in CCS provides an accelerated and rigorous education in mathematics to highly-motivated students. The small class sizes, close student-faculty interaction, and the flexibility of the program create an environment in which students can develop high-level abilities in mathematics. These skills allow students who choose to do research in mathematics or related fields make significant contributions during their undergraduate careers. Summer research fellowships are available by application to help make this possible, for example: SURF and the Math Summer Research Experience for Undergraduate Program. Moreover, because of the depth of their knowledge, students are often well-positioned for industry-related internships.

CCS Mathematics is a joint program between the College of Creative Studies and the Mathematics Department in the College of Letters and Science (L&S). More information about CCS Mathematics may found on our website http://ccs.math.ucsb.edu/ and further questions may be sent to either Dr. Maribel Bueno Cachadina (mbueno@ucsb.edu) or Dr. Karel Casteels (casteels@ucsb.edu).

CCS Mathematics Major Requirements

Every CCS student creates their own course program with the guidance of a faculty advisor. However, there are some standard requirements that all students must satisfy.

Core Mathematics Classes

By the end of their sophomore year students should have completed the following classes in CCS:

- Introduction to Higher Mathematics (CS128)

- Problem Solving I & II (CS101AB)

- Advanced Linear Algebra (CS108AB)

- Introduction to Real Analysis (CS117)

By the end of their junior year, students should have completed Probability (CS121) and at least two of the following sequences. The third must be completed by the end of their senior year.

- Complex Analysis (CCS122AB)

- Abstract Algebra (Math111ABC)

- Real Analysis (Math118ABC)

Elective Mathematics Classes

In consultation with their faculty advisor, students pick 12 additional classes. These classes can be any CCS or upper-division Mathematics Department class, any Mathematics Department graduate classes (except the Math260 series), or data science-related Probability and Statistics classes.

- Two electives must be CS120: Special Topics, taken above freshman level.

- Students must take at least one class from three of the following areas:

    1. *Number Theory and Combinatorics*: Math115AB, Math116, Math137A.
    2. *Geometry and Topology*: Math113, Math132A, Math145, Math147A
    3. *Differential Equations and Applied Mathematics*: Math104ABC, Math114, Math119AB, Math124AB, Math108C.
    4. *Probability and Statistics*: PSTAT120BC, PSTAT160AB, PSTAT126, PSTAT131.

- Math199 (Independent Studies) can count at most twice.

- Math182 may count as an elective with approval of the advisor.

- Mathematics classes whose description states that they are aimed at future teachers or transfer students cannot count as an elective.

- Mathematics Graduate classes (except Math260) may be taken as an elective only after sufficient undergraduate preparation. Students who aim to do this should speak to their advisor as soon as possible.

- Online courses, even if equivalent to a UCSB class, cannot count here.

Elective non-Mathematics Classes

Students must take two additional classes. One of these must be a class in which they learn a programming language that they have not previously learned. Possibilities here are CMPSC 8, 9, 16, PSTAT 10 and CCS Computing 20, or another class with CCS Math Steering Committee approval.

The second class can be any other class from the Department of Computer Science, any class from the Department of Physics, or ENG3.

This requirement is waived for students who complete a double major with CCS Computing.

Research Experience Requirement

Students must obtain a substantial amount of research during their time in CCS. Generally speaking, this means the application of mathematics to expand the boundary of human knowledge.

There are different ways of obtaining such experience and students are encouraged to seek out opportunities as early as possible. Primary examples include summer research (possibly via an REU or a CCS SURF), an internship at a national laboratory or other governmental organization, industrial internships, the Math Department Directed Reading Program, or independent research under the guidance of a UCSB faculty member leading to a senior thesis.

In their senior year, students should provide a research portfolio to the CCS Math Steering Committee explaining their work and why it should satisfy the research experience requirement. Any output such as interim reports, posters or published/submitted papers should be included.

Evaluation Process

Courses taken within CCS are not letter-graded. Instead, each student is awarded a variable number of units based upon performance in the course. Students in CCS are expected to take responsibility for their work and learning at the outset of their undergraduate careers. Evaluation criteria include mastering course material, regular attendance and class participation, and the number and quality of completed assignments.

If zero units are earned in a class, there will be no record of the course on the students official UCSB transcript.

If a student gets less than $n-1$ units in an n-unit CCS class, then the class will not count toward the major requirements. In the case that the class is the first of a sequence, the student may still be able to take the second course with instructor approval.

All letter-graded classes taken for the major requirements must be passed with a grade of C or higher.

General Education Requirements

Students must pass, with a grade of at least a C, eight letter-graded, ≥ 3 unit classes from any department besides Mathematics, Probability and Statistics, Physics or Computer Science. Additionally at least five of these classes must come from a department in the Division of Humanities & Fine Arts or Division of Social Sciences. Of these, one must be Writing 2 or an upper-division Writing class. Another must satisfy the UCSB Ethnicity Requirement. The UCSB History and Institutions requirement must also be satisfied if not done so through High School.

Masters Program - BS/MA Program

CCS Math students can complete both a Bachelors and a Masters degree program. This normally requires five to six years of study. Students who take this route complete the major requirements for the undergraduate degree except the research experience requirement, and then move on to complete the normal MA requirements which may be found on the Mathematics Department website. Classes taken during completion of the BS may not count toward their MA requirements.

Double Majoring

CCS students may double major both within CCS or across colleges. When applying to UCSB as an incoming freshman or transfer student, students may apply at the same time to double major in Mathematics and Computing. For all other major combinations, students should apply to just one major, with the second possibly added while already attending UCSB. Each application is considered separately by the faculty in the corresponding major.

Students will need to complete all the requirements for both majors. A maximum of 8 upper-division units can overlap between major requirements.

Minors

To obtain a minor, the students should consult the relevant department's minor requirements. A maximum of 5 upper-division units can overlap between major and minor requirements.

Academic Advising

Each student will be assigned a faculty advisor. Students are required to meet with their advisor at least once a quarter to discuss their coursework and any other academic issues. The advisor will evaluate their progress toward completing major requirements and help the student select a unique program of study based on their individual interests and goals.