CCG & MATH PATHWAYS

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USG Degree Bachelor’s and Below Production 2008-2016 and Trend to 2025
“Mathematics courses are the most significant barrier to degree completion in both STEM and non-STEM fields.”

WHY IS CCG LOOKING AT MATH?

Momentum
Alignment
Removing barriers

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BACKGROUND

2013 USG Mathematics Task Force

8 recommendations

#2: “Align gateway mathematics course sequences with academic programs of study. In particular, College Algebra should not be the default class for non-STEM majors.”
**2013 USG Mathematics Task Force**

“Most students in non-STEM majors would be better served by enrolling in Quantitative Reasoning or Introduction to Mathematical Modeling, possibly followed by a statistics course in Area D (Natural Science, Mathematics, and Technology) of the core curriculum.”
According to the Mathematical Association of America, the principle purpose of college algebra is to prepare students for pre-calculus and calculus.
THREE MATH GATEWAYS

1. **MATH 1001** Introduction to Quantitative Reasoning
2. **MATH 1101** Introduction to Math Modeling
3. **MATH 1111** College Algebra
For many disciplines, quantitative reasoning or math modeling, perhaps with further study in statistics is the best fit.

**USG’S FOUR MATH PATHWAYS**

<table>
<thead>
<tr>
<th>STEM</th>
<th>Science, Technology, Mathematics majors</th>
<th>Pre-calculus or Trigonometry</th>
<th>Calculus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Engineering majors and all Georgia Tech students</td>
<td>Calculus</td>
<td>More Calculus</td>
</tr>
<tr>
<td>Non-STEM</td>
<td>Majors that require calculus at some point in the sequence</td>
<td>College Algebra</td>
<td>Pre-calculus » Calculus</td>
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<tr>
<td></td>
<td>Everyone Else</td>
<td>Math Modeling or Quantitative Reasoning</td>
<td>Statistics</td>
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</table>
Across the System, about 32 percent of all bachelor’s degrees conferred are in STEM fields, an additional 20 percent are in Business.

INTERESTING FACT: Between 2012 and 2016, STEM degrees grew at nearly 3.5x the pace of non-STEM degrees.
MATH COURSE ENROLLMENT
System-wide first-time freshmen (FTF) math course enrollment within 2 academic years of first enrolling in any USG institution (5 year average)

- No college-level math courses at any institution, 18.6%
- MATH 1001, 4.1%
- MATH 1101, 9.6%
- MATH 1111, 41.9%
- Higher than MATH 1111, 24.3%

~75% of FTF taking MATH 1111 are non-STEM majors

MATH1111 (Non-STEM), 32.2%
MATH 1111 (STEM), 9.7%
College Algebra (MATH 1111) was the most common first math course at 24 USG institutions in Fall 2014. (ranging from 34% to 90% of students taking College Algebra as their first math course depending on the institution)
TO SUM UP

• 40% of students are in College Algebra as their first math
• 77% of MATH 1111 students are not STEM majors
• Pass rates for non-STEM majors in College Algebra are in the upper 50% range.
• One in five students who PASS College Algebra go on to take Calculus.

For 75% of USG students, College Algebra is the last math class they will take in college.
WHY IS THIS THE CASE?

Students may be advised into College Algebra as a “safe” option. (e.g., it is guaranteed to “count” even if a student transfers or changes major)

Students may be selecting College Algebra on their own. (“I’m in college; I’ll take a college math”)
WHY IS THIS THE CASE?

Other departments are skeptical of the rigor of non-College Algebra options.

(“Our students need ‘real’ math to succeed.”)

College Algebra is being used as a proxy for filtering out candidates from non-STEM disciplines.

(“Success in college algebra shows students can think.”)
This matters because College Algebra is not well aligned to a statistics sequence, which most non-STEM (and many STEM) students will need.
MULTI-PRONGED SOLUTION

✓ Advising & Program Maps
✓ Discipline-specific math recommendations (available at completega.org/math-pathways)

☐ Assurance of the rigor of non-College Algebra courses
☐ Research on student outcomes in “other” math courses.
CCG MATH PATHWAYS RESOURCES

Completega.org/math-pathways
THANK YOU

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