UNIVERSITY OF VIRGINIA
SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Definition of Mathematics/Quantitative Reasoning Competency:

All students graduating from the University of Virginia's School of Engineering and Applied Science (SEAS) should be able to demonstrate the following competencies in mathematic/quantitative reasoning:

1. Use proper mathematical notation and terminology.
2. Express mathematical arguments clearly, demonstrating an understanding of what is necessary and sufficient support.
3. Solve multi-step problems.
4. Graph basic functions without a calculator. These functions include linear, factored polynomial, trigonometric, exponential, and logarithmic.
5. Compute, without a calculator, derivatives and integrals of single variable and multivariable functions.
6. Set up and solve problems involving the application of the derivative and integral in both single variable and multivariable context. Such applications must include optimization, rates of change, area, volume, arc length.
7. Set up and solve simple problems in polar and spherical coordinate systems.
8. Calculate and use the dot product and cross product.
9. Solve the differential equations $y' + y = 0$ and $y'' + y = 0$.
10. Define the concepts of linear independence; superposition.
11. Solve nth order, homogeneous constant coefficient ODEs.
12. Solve nth order, inhomogeneous constant coefficient ODEs.

Description of Methodology Used to Gather Evidence of Mathematics/Quantitative Reasoning Competency

In spring 2004, the University administered the "Collegiate Assessment of Academic Proficiency" (CAAP) test in Mathematics/Quantitative Reasoning to a random sample of not less than 5 percent of fourth-year undergraduates enrolled in the School of Engineering and Applied Science. We believe an exemplary score (above the 95th percentile) on the American College Testing Service's (ACT) CAAP tests for Mathematics/Quantitative Reasoning would show that Engineering undergraduates are achieving the goals listed. Moreover, results of this test provide information on the competency levels of UVa students in comparison with students at other institutions using the same test.

The results below show the mean test score and the percentile ranking of UVa students compared to all other students in the United States who took the same test. The test is scored on a scale of 40 to 80.

Results for spring 2004 assessment of Mathematics/Quantitative Reasoning Competency	School of Engineering and Applied Science All Majors and Concentrations
Mean Test Score	66
Percentile Ranking	98

Summary:

As expected, Engineering students did extremely well on the CAAP test, scoring in the 98th percentile of all students who have taken the test in the last three years.