B.S./M.S. Sci & Tech / Computational Mathematics Program Statements

The vision of the B.S./M.S. Science & Technology / Computational Mathematics program offered by the NJ Center for Science, Technology & Mathematics (NJCSTM) is to develop a state and nationally recognized center for high performance computing and computational applied mathematics education. The mission of this five year, combined degree program is to train scientist-researchers to advance and support the role of computational infrastructure to solve problems in science, engineering, and design fields. A driving goal of the faculty and students in this program is to advance a research institute for computational and applied mathematics with the computational infrastructure to support program, university and regional scientific computing needs.

B.S./M.S. Sci & Tech / Comp. Math Student Learning Outcomes (SLOs)

For the Student Earning a B.S./M.S. Degree in Computational Mathematics

It is our expectation that graduates from the NJCSTM will have these characteristics:

- SLO1: Graduates will be strong candidates who may continue their education by pursuing doctoral degrees in related fields of study or otherwise seek career employment in the field of applied mathematics.

- SLO2: Graduates will be versatile and resourceful scientist-researchers who can adjust to this ever-changing field because of their comprehensive, integrated knowledge of applied mathematics, chemistry/physics and biology.

- SLO3: Graduates will be able to combine critical thinking skills and applicable practical knowledge in applied mathematics in the design, performance and analysis of computational work both as an individual and as effective and productive project team members.

- SLO4: Graduates will be able to verbally express themselves and communicate scientific comprehension and knowledge in both formal oral presentations and in written format clearly, concisely and accurately.

- SLO5: Graduates will be proficient in scientific programming, including aspects of software engineering practice including verification and validation as well as application to modern computational architectures.

- SLO6: Graduates will be able to apply numerical modeling to problems in the sciences, including choice and implementation of numerical algorithms for iterative continuous and discrete systems.

- SLO7: Graduates will be able to optimize problems with multiple variables that depend linearly or non-linearly on many discrete or continuous variables.

- SLO8: Graduates will be able to manipulate, mine, and visualize large datasets.