

Cultivating STEM Majors at Middle Georgia State University

Middle Georgia State University seeks to improve performance and retention in STEM core courses and majors using a system that supports STEM majors from admission through graduation. Specifically, we intend to increase STEM student engagement and success by: 1) Encouraging engagement in STEM activities and increasing undergraduate research opportunities among potential science, math and engineering majors. (Year 1); 2) Creating pathways of success to retain STEM majors by increasing “STEM-specific” advising and partnering STEM faculty with the Student Success Center and the Math Academic Resource Center (MARC) (Year 2); and 3) Redesigning designated sections of Freshman Year Experience Seminar (FYES) courses to be “STEM-centric (Year 3).

In year one, activities will include allowing faculty the opportunity to apply for mini-grants to fund undergraduate research projects. Research activity creates an environment that allows faculty to closely mentor the student and to build relationships that will allow the faculty to shepherd the student towards completion of their program. These undergraduate research experiences will culminate in student presentations and papers presented at our Undergraduate Research Symposium and other regional conferences. The research experience will prepare students for post graduate work and help to sustain their interest in STEM disciplines.

In year two, the focus will shift to advising STEM students. We plan to offer orientation sessions directed at STEM majors that would both facilitate efficient delivery of information essential to incoming freshman and would also serve as the beginning/introduction to a Live and Learn community designed to improve success and retention rates among STEM students. STEM orientation sessions will be held on our two larger campus locations (Macon and Cochran). Additionally, STEM faculty, in collaboration with the coordinator and specialists at the University’s Student Success Center, will create pathways to success that will promote student achievement in STEM courses. This will involve extensive use of Student Success Center tutoring services and partnering with STEM course faculty to create supplemental activities (e.g., online tutorial sessions, workshops, group tutoring sessions) that will strengthen and remediate weaknesses which hinder student progress in key STEM courses.

Finally, in year three, we will redesign Freshman Year Experience (FYE) course curriculum to be STEM-centric for majors. We will modify the current content to benefit STEM majors. The *student skill*-building portion of the course focuses on utilizing the library and library resources, learning time management skills, test-taking and reading skills, and learning to utilize student support services and the college catalog. Our proposed “STEM-centric” redesign of this segment would focus on utilizing library resources to research scientific/mathematical literature, learning to understand and utilize scientific and mathematical terminology, developing science and math textbook reading skills, technical writing skills, analytical problem solving skills, data collection, data analysis/graphs, test-taking skills in STEM courses, and project-based learning activities that involve both math and science. The second portion of FYE, *career exploration and goal setting*, typically involves self-discovery exercises, such as a personality survey and exercises in creating a career pathway, and often involves an introduction to the career center and on-campus career fairs. We will redesign the course in a way that keeps these activities, but with a STEM focus, i.e. knowing STEM programs of study, discussion of STEM career pathways. We would also introduce student engagement activities related to science and math, such as connecting with student organizations for science and math, STEM-related trips and excursions, and on-campus STEM activities.

Our targets are to improve access and completion for underserved students, shorten time to degree, restructure instructional delivery and transform remediation.

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