

University of West Georgia
College of Science and Mathematics
STEM Education Improvement Plan

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The University of West Georgia’s STEM Education Improvement Plan will be a multi-faceted plan that will seek to address two of the three goals of the USG STEM Initiative;

GOAL 2: Improve performance and retention on STEM core courses and majors

GOAL 3: Prepare and support P-12 STEM teachers in Georgia’s classrooms.

The plan seeks to build on the success of the University of West Georgia Institutional STEM Excellence (UWise) program, which has been funded since 2011 by the University System of Georgia’s STEM II Initiative.

The components of the plan (described below) include (i) developing year-long STEM cohorts where incoming freshman STEM majors take courses together, (ii) using a variety of interventions to improve performance in core mathematics courses, (iii) supporting science and mathematics faculty using evidence-based teaching pedagogies in their classes, (iv) implementing an undergraduate research and mentoring program to improve student engagement in their chosen STEM field, and (v) implementing a tutoring program for students preparing for a career as P-12 STEM teachers.

1. STEM Cohort Program

In an effort to increase the retention and graduation rates of a larger proportion of STEM students, we will implement a STEM Cohort Program in which the incoming freshmen will be grouped together in core classes that include ENGL 1101 and 1102 courses specially designed for STEM majors (STEM to STEAM), XIDS 2002 (Thinking Like a Scientist) and a math class equipped with the interventions described below.

2. Core Math Interventions

Math 1111 (College Algebra) has been a traditionally high DFW course at not only the University of West Georgia, but also many other universities in the USG system and nationwide. Thus, lowering the DFW rate in MATH 1111 will increase the retention rate of STEM students at the university. Other universities have had success in lowering their DFW rates in the course by implementing an Emporium Model. Our version of the model will consist of students attending two hours per week in class, and three hours per week in a computer lab (the “Emporium”) developing their mathematics skills using ALEKS, an artificially intelligent assessment and learning system.

MATH 1113 (Precalculus) is another traditionally high DFW course nationally, and at UWG. Since MATH 1113 is the first required MATH course for all STEM majors at the university, decreasing the DFW rate in this one course should have a dramatic impact on the retention rate of STEM majors and, ultimately, the number of graduates with STEM degrees. We will reduce DFW rates in Precalculus by using a combination of intervention tutoring (for high-risk students) and supplemental instruction (for moderate-risk students).

3. Faculty Mini-grants to Improve Core Science Courses

As part of the SEEP Program, STEM departments and faculty will be able to apply for funding to develop and implement evidence-based teaching and learning pedagogies in their science classes, with the goal of increasing student learning in those and subsequent courses. The selected mini-grants will include a focus on courses that have a major impact on STEM student's success and retention.

4. Undergraduate Research and Mentoring Program

The College of Science and Mathematics at the University of West Georgia prides itself on its history of providing research experiences for undergraduates. We believe these experiences allow students to forge strong bonds with the faculty research advisors and other students in the laboratory, increasing student engagement and rates of student success and retention in STEM fields. The SEEP program will combine grant funds with existing student research funds on campus to create research opportunities for freshmen and sophomores and employ upper-division students with research experience to act as mentors.

5. Tutoring for Students in UTEACH Program

The University of West Georgia is one of three recipients in Georgia of a UTeach replication grant (2011-2015). The program is a collaborative effort between the University of West Georgia's College of Science and Mathematics, College of Education, and local school districts that aims at preparing mathematics and science secondary education teachers through an innovative approach using 5E lesson plans (Engage, Explore, Explain, Elaborate, Evaluate). Attrition rates for upper-division students in the UTeach Program has been problematic. We will address this by implementing peer tutoring and coaching programs for those students. Peer tutors will offer valuable tutoring in the content courses and 5E lesson plan design and help students navigate through heavy course load requirements with peer coaching.