



AEP FULL STEAM AHEAD

IMPACT

- Increase youth awareness of and desire to participate in STEAM fields
- Establish early college research participation opportunities for undergraduate students
- Establish a faculty research position to support increased focus on bioenergy and bioremediation, increasing undergraduate research opportunities and providing vital academic programming through integrated research and educational activities

The American Electric Power Full STEAM Ahead Program is designed to increase the interest of young people, from kindergarten through baccalaureate degree programs, in energy and other STEAM (Science, Technology, Engineering, Agriculture and Mathematics) based education, and to expand WVSU's core research programs in energy. This project is funded in part by the West Virginia Higher Education Policy Commission Research Trust Fund.

Currently, the U.S. faces a shortage of well-trained scientists, health care workers and engineers. According to the Southern Education Foundation (SEF), Historically Black Colleges and Universities (HBCUs) are "a vital resource for efforts to increase the Black presence in Science, Technology, Engineering and Mathematics (STEM) fields." In 2000, HBCUs graduated 40 percent of all African-Americans who earned degrees in Chemistry, Astronomy, Environmental Sciences, Mathematics and Biology. In a recent study, the SEF found that "preseason programs are an important means to encourage African-American high school students to pursue STEM studies/careers and help prepare them for success in college. Students who participated in such programs tended to do better than those who did not."

WVSU currently offers a dynamic range of programs supporting STEAM engagement by students and faculty. These fields are a focal point for each of the three mission areas of this engaged land-grant University, comprising efforts in formal classroom instruction and degree programs, laboratory research, and extension and outreach efforts.

Each of the University's land-grant mission areas serve a specific role in working to increase the number of students entering the STEAM career pipeline. Many of the University extension and outreach initiatives focus on developing interest in STEAM careers in K-12 youth, as well as in the college population. Classroom education focuses on matriculating students through degree programs in professional STEAM fields and graduate study, while researchers create new knowledge and engage advanced undergraduate students in meaningful laboratory experiences to expand their skill sets.



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FOCUS

The AEP Full STEAM Ahead initiatives will foster evidence-based practices, modeled on programs proven successful across the country, and will promote focused academic support, ongoing mentoring and student engagement. The proposed recruiting efforts will build upon existing programmatic infrastructure for sustained, year-round STEAM support in surrounding communities. Ongoing mentoring and student engagement will expand on the University's prior success in placing students in

undergraduate research positions and internships with University faculty. Early academic support will include an undergraduate program connecting teaching and learning more closely with faculty research, while targeting freshmen and sophomores. Combined with existing programs for juniors and seniors, this initiative will establish an undergraduate research continuum that is a rigorous and concentrated experience leading to better four-year graduation rates and career preparation.

SCOPE

K-12 Energy Based-Outreach: WVSU's Center for the Advancement of Science, Technology, Engineering and Mathematics (CASTEM) is expanding educational outreach offerings in the STEM areas through implementation of an energy-based educational. Nationally recognized energy-based curricula are being utilized to deliver educational modules for each of the K-12 grade levels. Modules include lessons and hands-on activities explaining the basics of energy, alternative energy sources and generation, energy efficiency and energy conservation. Through introduction of agriculturally focused content, the program is moving toward a STEAM model with modules that educate students about the connectivity of agriculture and energy. Programs are being administered to students in after-school settings through the WVSU 4-H Youth Development Program and through CASTEM outreach.

Research Rookies: We are offering college freshman and sophomore students an opportunity for meaningful participation in STEAM-related laboratory research from

their first semester on campus forward. The aim of Research Rookies is to engage highly motivated freshmen in faculty-mentored, hands-on research activities. Students will explore topics in their intended majors, develop relationships with faculty in their field, and gain valuable research and critical-thinking skills. Ultimately, the program objective is to improve the retention of promising, high-achieving first-year students—particularly first-generation, low-income and underrepresented minority students—by providing the academic and psycho-social support necessary to facilitate a seamless transition from high school to the sophomore year of college

Assistant/Associate Research Professor of Bioenergy and Environmental Biotechnology: We are developing new research and curricula to serve the growing need in West Virginia to train students for jobs in the Marcellus shale/natural gas/bioenergy sector through the addition of an Assistant/Associate Research Professor of Bioenergy and Environmental Biotechnology.

CONTACT

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