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Texas Woman's University chemistry program earns top national recognition

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Serious science + civic responsibility = winning formula

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First and second year students learn about sustainability by converting aluminum beverage cans into Play-Doh. Photo credit: Michael Modecki.

Jan. 25, 2018 – DENTON – Over the past decade, Texas Woman's University students in chemistry and biochemistry have turned aluminum cans into Play-Doh, sampled and analyzed water quality in the Trinity River watershed, and converted human energy on treadmills into potential electricity.

For “graduating chemists with civic lenses” and addressing such social issues as sustainability, water quality and safety, TWU has been singled out for special recognition. We use cookies on our site to provide you with the best user experience. (https://www.aacu.org/press/press-releases/aacu-selects-twenty-two-institutions-that-

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integrate-civic-responsibility-by-design-in-majors) by the Association of American Colleges and Universities (AAC&U) as a model for how to make civic learning and democratic engagement an expectation for all students who major in a given discipline.

Texas Woman's is one of nine universities, and the only one in Texas, featured in AAC&U's latest issue of *Peer Review*, "Civic Major by Design" (<https://www.aacu.org/peerreview/2017/Fall/TWU>) released at AAC&U's annual meeting this week. The TWU Department of Chemistry and Biochemistry is also the only science program recognized in the publication for its systematic inclusion of civic learning opportunities throughout all four years among 123 departmental submissions from across the country.

"We take great pride in preparing socially responsible chemists," said Richard "Doc" Sheardy, Ph.D., professor and chair of TWU's Department of Chemistry and Biochemistry.

He said he and his colleagues enhance student learning "by scaffolding questions and unsolved public issues" in "green chemistry" courses, labs and community experiences that include ethics, the importance of recycling and energy conservation, reduction of chemical wastes, water quality, environmental safety and use of more benign procedures for chemical synthesis.

Additionally, juniors and seniors participate in the annual Pioneer Research event at Denton's Golden Triangle Mall, where they engage younger students and large public audiences in discussions about scientific issues that affect health, the environment and public policies.

"This approach helps develop much-needed skills such as critical thinking, clear communication, teamwork, and personal and social responsibility," Sheardy added.

One recent TWU student who now advocates for this program is currently pursuing a doctoral chemistry degree at Duke University. Courtney Johnson, who earned her bachelor's degree from TWU in 2015, credits her first exposure to responsible scientific practices to Texas Woman's organic chemistry lab.

"Science issues have a real and broad impact on society, and because scientists have both knowledge and the ability to apply it, we have a responsibility to consider the impact of how we practice science," Johnson said. "We must communicate what we have learned with the broader public, who often fund our research through their tax dollars and may have a shared interest in our findings."

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TWU's transition to a more student-engaged, hands-on, civic approach to teaching began a decade ago when a team of TWU faculty and administrators attended an institute sponsored by the National Science Foundation's Science Education for New Civic Engagements and Responsibilities (SENCER) project. This education reform project advocates infusing civic engagement and problem-solving in science courses to enhance student learning.

Because TWU has been so successful in adopting SENCER's approach, it now hosts the annual SENCER Center for Innovation-Southwest (<http://sencer.net/southwest/>) (SCI-SW) symposium on science education and civic engagement, along with technical and public poster presentations developed by faculty and student researchers. This year's symposium will be held in Denton Feb. 2.

TWU faculty members and SCI-SW co-directors, Cynthia Maguire, M.S, and Nasrin Mirsaleh-Kohan, Ph.D., also visit other institutions in the region to present faculty development seminars on ways to incorporate civic engagement into courses, programs and undergraduate research.

"We began using this approach in our core science classes for non-majors in 2007. Using civic issues to tie classroom learning to something students already perceive as important, and asking them to use their knowledge as they volunteer in the community, has been an invaluable teaching tool," said Maguire.

"We are excited to be pioneering new frontiers with this approach to learning" said Mirsaleh-Kohan. "While changes in the traditional methods of teaching chemistry and biochemistry often require a shift in culture, we can already see measurable progress in the classroom."

Caryn McTighe Musil, director of AAC&U's Civic Learning in the Major by Design project and the plenary speaker at TWU's upcoming SENCER symposium, said she was impressed by the creativity and variety of ways the selected departments used a "civic lens" to enhance the design of students' major areas of study.

"At TWU, students are asked to think about science used for good and evil, and they learn to care about the impact of their work in the world, understand ethical consequences and what happens when good and bad decisions are made," she said. "This is an exciting way to study science—students as problem solvers and the role they can play in becoming good neighbors, employees and in building a future that is good for everyone, not just themselves."

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About the TWU Department of Chemistry and Biochemistry

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The TWU Department of Chemistry and Biochemistry (<https://twu.edu/chemistry-biochemistry/>) offers both bachelor's and master's degrees, with programs leading to American Chemistry Society certification, teacher certification and preparation for medical and health-related professional studies.

About the Association of American Colleges and Universities

AAC&U is the leading national association dedicated to advancing the vitality and public standing of liberal education by making quality and equity the foundations for excellence in undergraduate education in service to democracy. Its members are committed to extending the advantages of a liberal education to all students, regardless of academic specialization or intended career. Founded in 1915, AAC&U now comprises 1,400 member institutions—including accredited public and private colleges, community colleges, research universities, and comprehensive universities of every type and size.

AAC&U functions as a catalyst and facilitator, forging links among presidents, administrators, faculty, and staff engaged in institutional and curricular planning. Through a broad range of activities, AAC&U reinforces the collective commitment to liberal education at the national, local, and global levels. Its high-quality programs, publications, research, meetings, institutes, public outreach efforts, and campus-based projects help individual institutions ensure that the quality of student learning is central to their work as they evolve to meet new economic and social challenges. Information about AAC&U can be found at www.aacu.org (<http://www.aacu.org/>).

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