

Preparing a Global Workforce with a Local Internship Program

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This work features an innovative internship program that is being developed in the Department of Industrial and Systems Engineering (ISE) at Virginia Tech through a collaboration with the Office of Vice Provost for Learning Systems Innovation and Effectiveness (LSIE), Virginia Tech. The internship program is designed to provide undergraduates in ISE with critical workforce skills prior to graduation through partnerships with local manufacturing employers. Opportunities to participate in paid internships that provide opportunities to apply classroom concepts to real-world scenarios related to Industry 4.0 challenges are critically important in the rural setting of this American research focused university. ISE undergraduates at Virginia Tech are traditionally encouraged to pursue internship opportunities prior to graduation so they can take concepts covered in courses such as cyber-physical systems, Internet of Things (IoT), cloud computing, and cognitive computing and apply them to current challenges faced in manufacturing environments. A full course schedule during the academic year requires that students look to the summer to secure these experiential learning opportunities or ‘stop out’ during a fall or spring semester if they want to pursue a cooperative learning experience (co-op). Utilizing the flexibility of summer or relying on co-op experiences can slow students time to degree. This is true especially given the rural setting of Virginia Tech as students have traditionally looked to relocate to engage in these experiences. The innovative internship experience that this session describes highlights partnerships that have been developed with local rural manufacturing focused industries. The paid internships were funded in partnership with local employers and a regional economic development organization. Strategic efforts ensure that the students are exposed to critical Industry 4.0 concepts in real world settings. The paid internships with local employers are designed with flexibility in mind. This allows ISE students to augment their classroom learning while they are enrolled in traditional fall/spring courses or during the summer while still making progress towards degree. This work will present the overall program design, the related assessment and evaluation work on program efficacy, and the findings from assessments conducted related to student development as it relates to skills needed for a global engineering workforce. Engineering educators can use the program design and related findings to consider how experiential learning opportunities can be used to adapt and refine engineering curriculum to create a workforce ready to take on Industry 4.0 challenges as they pertain to manufacturing.

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Biography / Biographies

Catherine T. Amelink, Ph.D., is the Acting Vice Provost for Learning Systems Innovation and Effectiveness and an affiliate faculty in the Department of Engineering Education at Virginia Tech. In her role Dr. Amelink works across the university to provide relevant workforce development opportunities for undergraduate and graduate students. Her work has recently focused on partnerships with industry to provide transdisciplinary learning experiences for undergraduate and graduate students as well as collaborating with faculty teams to address complex problems that

relate to immediate workforce challenges. Her work has been published in the Journal of Engineering Education, Advances in Engineering Education, the International Journal of Engineering Education, the Journal of Women and Minorities in Science and Engineering, the Journal of Community College Student Development, the Journal of Women in Higher Education, and has presentations over multiple years at the American Society of Engineering Education and the American Educational Research Association conferences.