Nomination Packet for the 2022 F. Jay Taylor Undergraduate Teaching Award

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A. List of undergraduate courses taught, enrollment as of 9th day rosters (Enrolled), retention rates from final enrollment (Retained), and overall student evaluation scores

Quarter	Course	Retained/Enrolled	% Retained	Eval. Score
Fall 2016	ENGR-120-006	35/43	81	3.8
	ENGR-220-002	34/49	69	3.2
	FYE-100-018	27/27	100	n/a
	HNRS-120-H01	22/22	100	3.7
Winter 2016-17	ENGR-122-002	15/17	88	4.0
	ENGR-220-003	27/43	63	3.8
	HNRS-121-H07	11/12	92	3.9
Spring 2017	ENGR-120-001	22/28	79	3.9
	HNRS-122-H06	23/23	100	3.9
Fall 2017	ENGR-120-006	31/42	74	3.9
	ENGR-121-001	20/21	95	3.8
	FYE-100-013	36/36	100	n/a
Winter 2017-18	ENGR-122-001	49/52	94	3.7
	HNRS-121-H05	17/17	100	3.8
Spring 2018	ENGR-120-001	22/28	79	3.9
	ENGR-122-004	23/23	100	3.9
	ENGR-189A-001	28/28	100	n/a
Fall 2018	ENGR-120-004	33/36	92	3.9
	ENGR-121-001	36/37	97	4.0
	ENGR-189A-001	35/36	97	n/a
	FYE-100-013	40/40	100	n/a
Winter 2018-19	ENGR-121-007	19/22	86	3.8
	ENGR-122-001	31/31	100	4.0
	ENGT-121-001	9/10	90	4.0
Spring 2019	ENGR-120-003	17/24	71	4.0
	ENGR-122-004	29/32	91	4.0
Fall 2019	ENGR-120-004	29/31	94	3.9
	ENGR-189A-001	31/31	100	3.9
	ENGT-120-001	10/11	91	4.0
	FYE-100-013	38/38	100	4.0
Winter 2019-20	ENGR-121-005	27/29	93	3.9
	ENGR-122-001	35/36	97	3.7
	ENGT-121-001	14/16	88	4.0
Spring 2020	ENGR-120-001	18/22	82	4.0
	ENGR-189A-001	21/22	95	4.0
	HNRS-122-H01	19/19	100	3.9

Fall 2020	ENGR-120-003	26/30	87	4.0
	ENGT-120-001	12/13	92	3.9
	FYE-100-023	30/31	97	4.0
Winter 2020-21	ENGR-121-001	22/23	96	4.0
	ENGT-121-001	13/13	100	4.0
Spring 2021	ENGT-222-001	14/14	100	3.6
	HNRS-122-H03	24/24	100	4.0
Fall 2021	ENGR-120-002	28/28	100	4.0
	ENGR-121-002	35/38	92	3.7
	ENGR-189A-001	28/28	100	4.0
	HNRS-100-H13	47/47	100	3.9
Winter 2021-22	ENGR-121-001	27/29	93	4.0
	ENGR-122-001	18/20	90	3.8
	ENGT-121-001	23/25	92	3.9
Spring 2022	ENGT-222-001	24/25	96	n/a
	HNRS-122-H03	24/24	100	n/a

Since starting at Louisiana Tech in fall of 2016, I have taught 13 different courses for a total of 52 different course sections. On average, I teach approximately 3 courses per quarter. My average teaching evaluation rating is 3.9/4.0 and my overall retention percentage is 93%.

B. Personal statement of beliefs concerning the significance of undergraduate teaching within the overall mission of Louisiana Tech University

As I reflect on the mission statement of Louisiana Tech,

> *"As a selective-admissions, comprehensive public university, Louisiana Tech is committed to **quality** in teaching, research, **creative** activity, public service, and workforce/economic development. Louisiana Tech maintains as its highest priority the education and development of its students in a **challenging**, yet safe and **supportive**, diverse **community** of learners."*

the words quality, creative, challenging, supportive, and community are all ideals that guide my beliefs toward undergraduate teaching. When I approach a course, I consistently want to provide a supportive community that encourages quality education that is challenging and prepares our students for the workforce.

My approach and beliefs concerning undergraduate teaching have developed over time as I have continued to teach first year and sophomore engineering courses. However, my own experience as a struggling first-year student at Louisiana Tech taught me how critical **quality** teaching and comprehensive academic **support** are for the success of beginning students. In 2004, as an 18-year-old from south Louisiana in the strange land of north Louisiana, I remember feeling so lost and overwhelmed with college. I recall one instance during my first fall quarter where I just cried in my mother's arms, begging to go home. In retrospect, I am thankful she held firm and wouldn't allow me to give up. At this point in my studies, I had not yet started my engineering courses. The next quarter, I began taking my first engineering course, ENGR 120. It was blocked with my math and science courses. This structure of having the same students in my courses was crucial for my retention. The community that this structure fostered helped me to feel connected, encouraged, and supported. The instructors that I had at this early stage provided me with a strong foundation for the engineering

courses I would be taking later. These instructors were approachable and made me feel like they cared about me and my education. I felt challenged, but also supported.

Fast-forward eighteen years and I find myself in charge of the very program that made such a difference in the life of my 18-year-old self. I am the First-Year Engineering Programs Coordinator. While I do teach many first-year courses, my larger role is guiding the entire first-year engineering experience, the experience that shaped me as a student, engineer, and now as a professor. I am now working with those faculty members who mentored me as a student. I try to keep the younger version of myself in my mind as I work with the first- and second-year students of today. I work to maintain the ideals of **community** and **support** initiated by my predecessors while also driving the content forward as we evolve our programs with the changing students and times. I continue to seek out resources and publications that highlight emerging pedagogies for engagement and learning. I try to incorporate these ideas my own courses and also provide them to faculty that work in the first-year program with me.

I try to foster a **supportive** environment in my courses that focuses on **community** because I know that, as an undergraduate, if I hadn't had the support from my community of peers and instructors, I would not have been successful. This support is a critical component of the first and second year and has significant impacts on retention and a student's overall experience in college.

As an undergraduate, I recall being challenged as a student, but I also remember the satisfaction of perseverance and figuring out "the hard problems." Now as I teach undergraduate students, I try to foster these same feelings of being **challenged** through **creative** engagement in the classroom with project-based learning. I push students to see that they are capable of more than they think.

I am passionate about **quality** undergraduate engineering education. The feeling of satisfaction that I got when I would persevere through the hard problems in my undergraduate studies, I now get when I see one of my students have the same euphoric moment. It is a privilege to work with these students and have an impact on their education, experiences, and future careers.

C. Important innovations in undergraduate teaching

I oversee the first-year engineering course sequence, Living *with* the Lab (LWTL), which includes ENGR/HNRS 120, ENGR/HNRS 121, ENGR/HNRS 122. These courses are taught by a team of 14-20 faculty each year with an average of 615, 385, and 330 students in the curriculum each Fall, Winter, and Spring Quarter, respectively. I lead the effort to make changes to the curriculum and the projects that define the student experience. I revise existing course materials and create new original content as we seek to keep the content fresh and challenging. The enhancements that I make to the curriculum are adopted by all of the faculty who teach these courses, thus directly impacting all first-year engineering students at Louisiana Tech, regardless of discipline.

When I started in 2016, I worked closely with Dr. David Hall to restructure and elevate the LWTL curriculum, because although it had been adopted at several institutions across the nation, it had become somewhat stagnant. I evaluated the structure of the content while improving the resources for both faculty and students. As I designed new materials, I worked on scaffolding the content to better foster deep understanding without losing rigor. Through this process, I reordered the content, developed new projects in each course, and created new and additional support materials to enable faculty instruction and undergraduate student learning which can be seen in the over 200 new resources I developed in various forms such as presentations, videos, rubrics, etc.

While working with the LWTL curriculum, I noticed that the ENGR 120 course was a critical juncture for retention in the engineering program. As I looked at data from Fall 2012 to Winter 2017-18, I made the realization that the DFW rate was high with an average of 44% of the 3,418 students enrolled in ENGR 120 falling into this category. To help reduce this rate, I developed a supplemental course, ENGR 189A, that I offer in conjunction with ENGR 120. In this course, students receive more contact hours with their instructor, time in the classroom, and access to more conceptual problems. I strategically designed experiences to foster community and increase retention based on engineering education literature. Additionally, I have incorporated content that focuses on career applications and on the importance of making good academic decisions. Because the supplemental course is offered alongside ENGR 120, if a student in ENGR 189A decides to drop ENGR 120, I work with them to build an academic plan by exploring what went wrong and what they can do better next time, planning courses for the next quarter, investigating new majors when needed, and encouraging them to talk with a student success specialist.

Overall, the ENGR189A course has been well-received and has had significant impacts on student performance and retention. When comparing the students to their cohorts in ENGR 120 who were not taking ENGR 189A, the ENGR189A students experienced a 25% pass rate increase as well as a 10-point increase in midterm and final exam performance. The DFW rate for ENGR 120 students not taking ENGR 189A was on average 37% as opposed 12% for the students who were taking ENGR 189A. The significant impact that the ENGR 189A course has on retention in the first-year engineering program has inspired me to take this program further by applying for a $1.5 million NSF S-STEM grant which I submitted in February of 2022. I plan to continue ENGR 189A regardless of the outcome of the grant application, but if it is funded, the ideals, resources, and activities from the course will be further developed and offered across all levels of the undergraduate engineering curriculum.

D. Recent or relevant publications, papers, and/or presentations related to teaching

Reis, L., Corbett, K. **(Co-Presenter)**, DeLeo-Allen, A., "Closing the Socioeconomic and Academic Gaps to Increase Education Equity in STEM," 2020 Virtual Conference on Transforming STEM Higher Education: This Changes Everything (2020, November 5-7).

Corbett, K. **(Presenter)**, Evans, K., McAdams, S., Gaudin, J., Walker, M., Fontenot, T., "Work in Progress: Developing a Model for Student-led Peer Mentorship Programs," Proceedings of the American Society for Engineering Education, Salt Lake City, UT (June 24 – 27, 2018).

Corbett, K. **(Presenter)**, "Work in Progress: Redesigning Curriculum to Foster Student Success," Proceedings of the American Society for Engineering Education, Salt Lake City, UT (June 24 – 27, 2018).

Tims H., Turner G., Corbett K., Deemer E., Mhire J., "Cyber Value and Interest Development: Assessment of a STEM Career Intervention for High School Students," Electronic Journal of Science Education, Vol. 18, No. 1 (2014).

Corbett, K. **(Presenter)**, Coriell, J., Hahler S., "Assessing the First-Year Pilot of STEM: Explore, Discover, Apply – STEM Curricula for Middle Schools (Work in Progress)," Proceedings of the American Society for Engineering Education, Indianapolis, IN (June 14 – 18, 2014).

Corbett, K. **(Presenter)**, Tims, H., Turner, G., Nelson, J., "Utilizing the Engineering Design Process to Create a Framework for the Curricula Design," Proceedings of the American Society for Engineering Education, San Antonio, TX (June 10 – 13, 2012).

E. Additional pertinent information

E.1 Grants

- PI on NSF S-STEM Proposal (requested, $1,499,870), Submitted February 2022
    - S-STEM SUCCESS: Supporting Undergraduates through Curricular and Co-Curricula Engagement and Student Scholarships
- Co-PI on NSF Advanced Technological Education Grant (funded, $287,948), 2018 – Present
    - Controlling, Operating, and Measuring: Pathways for Learners to Engr. Technology Employment
- PI LaSpace proposal (funded, covered travel and program expenses), 2019
    - LA Space Consortium RockOn Program, mentored a team of three female COES undergraduate students at NASA Wallops Flight Facility in Virginia through an immersive experience culminating in building and sending a rocket payload to space to collect and analyze data

E.2 Keynote Addresses & Invited Talks

- COES Women in STEM at LA Tech Panel at Spring Recruitment Day (Ruston, LA)
- "Developing the Cyber Interstate" at the 22nd Annual Southwestern Business Administration Conference (Houston, TX)
- "Student Led Peer Mentorship Programs" at OWISE Faculty Luncheon (Ruston, LA)
- STEM Activity Leader at the 5th Annual Girls Learning about Math and Science (El Dorado, AR)
- "Opportunities for Girls in STEM" for the National Girls Collaborative Project (Shreveport, LA)
- "LA Tech COES First-Year Programs Recruitment" at Engineers & Scientist Day (Ruston, LA)
- "LA Tech COES First-Year Programs Recruitment" at Virtual Recruitment Events (Ruston, LA)

E.3 Professional Development Workshops & Courses

- ProQual Engineering Education Research Incubator, 2/2022 - present
- ProQual Institute for Engr. Education Research Methods (University of Georgia), 9/2021 - 12/2021
- CITI Program Training on Behavioral Sciences, 3/2022
- National Effective Teaching (NETI) Workshop, 9/2020
- Teaching Strategies Workshop (Brent & Felder), 2/2018

E.4 Service to the College of Engineering and Science and Louisiana Tech University

- Engineering Science Foundation Board faculty representative LA Tech University, 2016 - Present
- Serve as Society of Women Engineers (SWE) faculty advisor, 2016 - Present
- Serve as Mechanical Engineering senior design advisor (various groups), 2016 - Present
- Serve on faculty search teams (ISERC tenure track and ENGR/ICET lecturer), 2017 – Present
- Engineering Science Foundation Recruiting Working Group, 2016 - Present
- Serve as instructor of FYE 100 First-Year Experience, 2016 - Present
- Academic advisor to 25+ Mechanical Engineering undergraduate students, 2016 - Present
- Serve as graduate student committee member (3 students), 2019 - Present
- Develop and facilitate peer-mentorship training for student organizations, 2018 - 2020

E.5 Awards

- Student Learning and Success Award for College of Engineering and Science (LA Tech), 2019
- Student Quality and Outreach Award for College of Engineering and Science (LA Tech), 2018

E.5 Professional Membership

- American Society for Engineering Education, 2008 – Present
- American Society of Mechanical Engineers, 2004 - 2009 & 2015 - 2017