JONATHAN NEAL DAVIS

Curriculum Vitae

Jonathan N. Davis, Ph.D., P.Eng.

Table of Contents

Jonathan N. Davis, Ph.D., P.Eng. Senior Lecturer
Biosystems Engineering Department

Biography

I was born in Opelika, Alabama and grew up in Salem, Alabama. I attended the county school system in Smiths Station and graduated from Smiths Station High School. I enrolled at Auburn University in 1997 in Civil Engineer, but switched to Biosystems Engineering upon the advice of a good friend. I graduated from Auburn with a degree in Biosystems (Forest) Engineering in 2002, and enrolled in the Graduate School as a Master's student working for Dr. Jim Baier. As the Biosystems Department did not have an accredited graduate program at that time, my degree was a Master's of Science in Civil Engineering, and my research and coursework was focused on soil and water. I passed my Fundamentals of Engineering exam and became a licensed Engineer in Training in 2003.

In 2004 I was hired on to the firm of Stantec Consulting to work as a Water Resources Engineer in their Macon, Georgia office. I passed the Professional Engineering exam and received my PE license for Georgia in 2007. I was subsequently licensed in both Florida and Alabama as well. After advancing to Senior Project Manager at Stantec, I took a position with Foresite Group in Auburn, AL as a Project Manager followed by a short stint with Goodwyn, Mills, and Cawood in Montgomery, Alabama as a Senior Engineer.

In 2017 the opportunity to return to my alma mater and home department as a Lecturer came up and I was hired in the spring of 2017. I was promoted to Senior Lecturer in 2022. I completed a doctorate in Science Education at Auburn University in 2024. My current work focuses on teaching, assessment, continuous improvement of our curriculum and teaching methods, and advising student groups. My research focuses on engineering education, with an emphasis on the subjects of life-long learning, teamwork, and e-portfolios.

EDUCATION

Auburn University, Auburn, AL Bachelor of Science (Forest Engineering)	2002
Auburn University, Auburn, AL Master of Science (Civil Engineering)	2004
Auburn University, Auburn, AL Doctor of Philosophy (Science Education)	2024

ASSIGNED DUTIES

2023 – 2024	Teaching	75%	Admin	25%
2022 – 2023	Teaching	75%	Admin	25%
2021 - 2022	Teaching	75%	Admin	25%
2020 - 2021	Teaching	75%	Admin	25%
2019 - 2020	Teaching	75%	Admin	25%
2018 - 2029	Teaching	75%	Admin	25%

HONORS AND AWARDS

Honors, Awards, and Recognition by the Candidate

2023 **University Writing Committee (UWC) Award for Excellence in Writing Instruction for Academic Programs** The University Writing Committee's (UWC) Award for Excellence in Writing Instruction honors academic programs (undergraduate majors) and their faculty who have demonstrated sustained and successful efforts over the past five years to integrate evidence-based pedagogical practices across an undergraduate major. The award includes a $20,000 amount for the winning department.

2021 **William F. Walker Teaching Award for Excellence (Superior), Samuel Ginn College of Engineering.** The William F. Walker Teaching Awards recognize and motivate outstanding achievement by faculty members involved in the education of engineering students at Auburn. There are two levels of recognition – Merit and Superior. The latter represents the highest honor for instruction in the Samuel Ginn College of Engineering and is presented to one faculty member annually. It carries a $10,000 stipend.

2021 **Outstanding Faculty Member, Biosystems Engineering Department**. Annual award for the outstanding teacher in the department. Selection is made by biosystems engineering students.

2020 **Dean's Award for Excellence in Instruction, College of Agriculture.** The award recognizes the scholarship of teaching and learning and the efforts faculty members make to deliver innovative and high-impact instruction to best prepare students for their chosen career. The recipient of the award will have demonstrated scholarship in teaching and

learning as well as service to students in a manner that exceeds simply fulfilling assigned instructional duties. Innovative approaches to teaching and examples of dedicated efforts are expected of the selected award winner.

2020 **Outstanding Faculty Member, Biosystems Engineering Department**. Annual award for the outstanding teacher in the department. Selection is made by biosystems engineering students.

2018 **Affiliated Faculty of the Office of University Writing.** Recognized for service provided during summer of 2018 to the Office of University Writing for assisting with statistical analysis of their writing center usage by students for their annual Provost's report.

2019 **Outstanding Faculty Member, Biosystems Engineering Department**. Annual award for the outstanding teacher in the department. Selection is made by biosystems engineering students.

2018 **Outstanding Faculty Member, Biosystems Engineering Department**. Annual award for the outstanding teacher in the department. Selection is made by biosystems engineering students.

Honors, Awards, and Recognition by Students supervised by Candidate

2020 **ASABE Ethics Essay Competition (advised student 1st place award – Sydney Williford).** Open to undergraduate and graduate student members of ASABE and/or the Institute for Biological Engineering (IBE), entrants submit an original essay of up to 1,500 words, choosing an ethics topic impacting the practice of professions related to agricultural and biological engineering, systems, or technology.

2019 **ASABE Ethics Essay Competition (advised student 1st place award – Hannah Thomascall, 3rd place – Meg Anderson).** Open to undergraduate and graduate student members of ASABE and/or the Institute for Biological Engineering (IBE), entrants submit an original essay of up to 1,500 words, choosing an ethics topic impacting the practice of professions related to agricultural and biological engineering, systems, or technology.

2018 **ASABE Ethics Essay Competition (advised student 1st place award – LeeAnn Johnston, 3rd place – Cami Shands).** Open to undergraduate and graduate student members of ASABE and/or the Institute for Biological Engineering (IBE), entrants submit an original essay of up to 1,500 words, choosing an ethics topic impacting the practice of professions related to agricultural and biological engineering, systems, or technology.

2018 **ASABE Ethics Video Competition (advised student 1st place award – Justin Box).** In a video of five minutes or less, students must describe an ethical issue(s) faced by agricultural and biological engineers in practice or research.

SCHOLARLY CONTRIBUTIONS

a. Teaching

1. Recent Courses Taught

Semester	Course	Title	Lec. (hrs)	Labs. (hrs)	Enr. (n)
S25	BSEN 4310	Engineering Design for Biosystems*	2	6	43
S25	ENGR 2050	Engineering Statics	3	-	60
F24	BSEN 4300	Professional Practice in Biosystems Engineering	2	2	44
F24	BSEN 5560	Site Design for Biosystems Engineering	2	3	27
F24	BSEN 2210	Engineering Methods for Biological Systems	1	2	44
S24	BSEN 4310	Engineering Design for Biosystems*	2	6	59
S24	ENGR 2050	Engineering Statics	3	-	57
F23	BSEN 2210	Engineering Methods for Biological Systems	1	2	61
F23	BSEN 4300	Professional Practice in Biosystems Engineering	2	2	59
F23	BSEN 5560	Site Design for Biosystems Engineering	2	3	40

S denotes spring semester, F denotes fall semester
*Co-instructor

2. Past Courses Taught

a) BSEN 3230 Natural Resources Conservation Engineering (4 years)

b) AGRI 1000 Introduction to Agriculture (2 years)

3. Subject Matter Expertise

a) Biosystems Engineering

- a. Engineering Graphics
  - i. Fusion 360
  - ii. Civil 3D
- b. Hydraulics and Hydrology of Natural Systems

i. Floodplain modeling
ii. Stream flow measurement
iii. Rainfall and runoff estimation
iv. Watershed analysis and modeling

c. Erosion and Sedimentation Control
d. GPS/GIS
    i. ArcPro
    ii. Mapping of natural systems
e. Professional Development of Engineers
    i. Ethics, Professional Practice, and Licensure
    ii. Senior Capstone Design
    iii. Career Pathways for Engineers

b) Civil Engineering
    a. Water and Wastewater Engineering
        i. Storage and Pumping
        ii. Pipeline Design and Modeling
        iii. Pump Station Design
        iv. Water and Wastewater Treatment
        v. System Modeling
        vi. Regulatory Compliance
    b. Land Development & Site Design
        i. Site Assessment & Due Diligence
        ii. Residential, Commercial, and Industrial design experience
    c. Engineering Statics
c) Engineering Education
    a. Quantitative and Qualitative Analysis
    b. Discipline Based Education Research
    c. Survey Design and Validation
    d. Statistics

4. Professional Work Experience

- Auburn University, Biosystems Engineering Department – *Senior Lecturer*, 2017 – present.

- Goodwyn, Mills, and Cawood – *Senior Engineer*, 2016-2017. Consulting engineer responsible for design of civil, environmental, and municipal engineering projects.
- Foresite Group, Inc. – *Senior Project Manager*, 2013-2016. Consulting engineer responsible for all aspects of project management, design, bidding and construction administration of civil and environmental engineering projects. Managed projects and supervised employees.
- Stantec, Inc. – *Engineer I, II, II, Project Manager, Senior Project Manager*, 2004 – 2013. Consulting engineer responsible for design, bidding, and construction administration of Civil, Municipal and Environmental engineering projects. Managed projects and supervised employees.

5. Advising Contributions

a) Faculty Co-Advisor – EPA Rainworks Challenge Team, 2020:
   - Helped organize faculty and interested undergraduates from multiple colleges and disciplines to participate in the EPA Rainworks Challenge, a national design competition dedicated to creating real-world green infrastructure designs.

b) Faculty Advisor – Quarter Scale Tractor Team, 2018-present
   - Assisted team with administration and competition rules. Attended competition in 2018. Competition canceled in 2020 due to COVID-19. Team set record fundraising in 2020.

c) Faculty Advisor – American Society of Agricultural and Biological Engineering (ASABE) Student Branch, 2018-present
   - Assisted with officer elections, advise leadership team on activities, meetings, guest speakers, event planning, and fundraising.
   - Typically attend the Southeastern Rally where other member schools gather to discuss issues pertaining to undergraduate students, provide career planning, job opportunities, and research showcases.

d) Faculty Co-Advisor – Alpha Epsilon, 2017-present
   - Assisted Dr. Jasmeet Lamba with advising Alpha Epsilon, the honor society for ASABE.

e) BSEN Camp War Eagle representative, Summer 2017
   - Met all incoming BSEN freshmen, advised on their schedules, assisted with enrollment, hosted parents, and attended advisor meetings.

f) SOS Transfer Student representative, 2017-2018
   - Met with incoming transfer students, advised on their schedules.

g) Faculty Advisor for ~30 undergraduate students, 2017-2018, Fall 2023
   - Held advising meetings for each student before registration, advised on academic progress, trained to use Qlik, Banner, and Advise Assist.
   - Filled in for this role in Fall of 2023 for 90+ undergraduate students while search for full time Advisor was being conducted.

6. Courses and Curricula Developed

- **BATM 3100 – Computer Aided Design Technology (New Course).** Introductory course in computer aided design (CAD) and land mapping. Students gain competence in CAD operations used to fabricate parts and to develop field- and watershed-scale maps. Class and project topics include drawing for mechanical part fabrication and scale mapping for construction site development and agricultural field management. Co-developed with Dr. Mark Dougherty to specifically serve the BATM students.
- **BSEN 2210 – Engineering Methods for Biological Systems (Redeveloped Course).** This course was redeveloped in 2018 to a project-based learning (PBL) design. The course focuses on developing the skills and tools needed for new Biosystems Engineering students for use in their future BSEN courses as well as in their career. Technical skills such as Computer Aided Design (CAD), spreadsheets, data analysis, Matlab, and online tools are taught. Transferable skills of engineering communication are also used, such as technical writing, engineering graphics, life-long learning, e-portfolio, and public speaking. The course was converted to a module based PBL design utilizing the modules feature on Canvas in 2018. 3D printing was added to the course in 2019 to enhance the CAD skill module. Students design and test 3 projects throughout the semester, working in groups of 3-4. In 2024 modules were added covering the use of GPS and GIS, with students collecting data in the field then creating maps in ArcGIS Pro.
- **BSEN 5560 – Site Design for Biosystems (Redeveloped Course).** This course was redeveloped in 2017 to better reflect current trends in site design and land development for Biosystems engineers. Project-based learning and teamwork were added to allow students to experience the topics of site design through a semester-long hands-on project that are based locally in the community. When possible, the project is reality-based with a real 'client'. Students work in small teams of 4-5 and are presented with the project at the beginning of the semester. As the course proceeds, students build skills that allow them to work on each phase of the project. The course topics proceed in a similar fashion to projects in industry, to replicate the actual site design process. Students create a full set of design drawings and present on their final designs at the end of the semester. Students utilize Civil3D and ArcGIS Pro to create a full drawing packet and reports for their semester design project.
- **AGRI 1000 – Introduction to Agriculture (Redeveloped Course)**. Previously a basic lecture course, restructured content to focus on agricultural research, current issues in agriculture, and teaching transferable skills of writing, reading research papers, and creating multimedia presentations. Added numerous field trips to research and extension service units on campus, including swine management, soil and plant pathology labs, cattle/beef unit, poultry technology, controlled growth environments, fisheries, horticulture, and hydroponics/aquaponics. In addition to weekly field experiences, a guest lecturer series was organized where featured researchers and teachers from various agricultural-related areas came and gave lectures on current agricultural topics.

- **CAD Resources for BSEN/BATM Students.** This one-of-a-kind resource was created to serve students who wanted to learn about CAD outside of class. Many BSEN and BATM students utilize CAD for course work and projects, but there is not a dedicated CAD course of instruction available to students in the department. To help, a permanent Canvas page was created and loaded with custom video tutorials, links to industry resources (and tutorials), example files, and even self-paced learning modules with assessments. The page was launched in 2021 and each sophomore cohort of BSEN students is added every fall. Students may also ask questions to the group, post helpful resources, and create/start discussions on CAD topics.
- **URISE Program.** Designed a fully-online asynchronous self-paced course with 6 learning modules intended to address the knowledge gap that undergraduates often face regarding career pathways for post-secondary degrees and academic research. Many undergraduates who are interested in research, post-secondary degrees, or academic and research careers in engineering often are poorly informed compared to their knowledge of traditional post-graduation career pathways. URISE is designed to be engaging, with multiple learning modes, video, interactive graphics, and self-guided content to allow students to work at their own pace. This is a non-credit course, but students are provided a stipend and digital badge upon successful completion. Assessment takes place through a series of low-stakes reflective writing assignments.
- **Next Level Program.** Worked to design Next Level Career-Readiness Writing curriculum and program as part of Writing Across Curriculum workshop. Primary designer on Next Level assignments distributed throughout College of Engineering to over 1/3 of all COE students beginning in Fall of 2024. Faculty fellow in Next Level program and help facilitate and administer program along with the CDCR office in the COE.

7. Grants and Contracts

Principal Investigator and grant writer are listed in bold. Percent involvement of Mr. Davis is listed in parentheses.

Grants and contracts received

Authors	TITLE	SOURCE	TERM	BUDGET ($)
Davis, J. (80%) Dougherty, M. Fasina, O.	Uses and Impacts of E-portfolios for Biosystems Engineering Graduates	Auburn Univ. Office of University Writing	08/20 – 08/21	8,000
Ogles, M. Brodbeck, C. Davis, J.N. et.al. (10%)	3D Printing Training for Decatur Middle and Austin Junior High	Booz-Allen Hamilton, Inc.	01/21-02/21	5,000
Davis, J (33%) Dougherty, M. Linhoss, J.	URISE online program	Auburn University Office of	08/22-08/24	8,000

		Academic Insight		
Davis, J. (16%) Mailen, R., Givens, S., Fergus, J., Beckingham, B., Bowers, J.	Next Level Career-Readiness Writing program	Auburn University Office of Academic Insight	06/22-06/25	110,000
TOTAL				**131,000**

Grants and contracts applied for but awaiting results

Authors	TITLE	SOURCE	TERM	BUDGET ($)
Davis, J (33%) Higgins, B.	REU Site: Research experience through collaborative teams in bioprocessing for conversion of waste into products of value	National Science Foundation	2025-2028	460,000
TOTAL				**460,000**

Grants and contracts applied for but not funded

Authors	TITLE	SOURCE	TERM	BUDGET ($)
Davis, J.N., Davis, Jer., Fasina, O., Dougherty, M, Lamba, J. (70%)	The Academy for Writing: High Impact Practices	Auburn University Miller Writing Center	2017	4,000
Baker, L. Nickson, S. Ogles, M. Davis, J.N. (5%), et.al.	Auburn University (AU) Outreach's Workforce Innovation and Opportunity Act (WIOA) grant submission for advanced manufacturing training.	Alabama Department of Commerce	2021-2022	200,000
TOTAL				**204,000**

8. Publications and Presentations

Publications

a) Davis. J.N., Davis, Jer., Dougherty, M., Fasina, O. (2019) Life-long Learning for Engineering Graduates. ASABE Resource Magazine. v.26 no.5.

b) Davis. J.N., Dougherty, M., Tyndal, S., Fasina, O. (2021) Uses and Impacts of E-portfolios for Biosystems Engineering Graduates. ASABE Conference Proceedings.

c) Dougherty, M., Davis, J.N., Fasina, O., Davis, Jer. (2022) Senior design cultivates critical thinking and problem solving skills. ASABE Resource Magazine.

d) Davis, J.N., Fasina, O., Fergus, J. (2023) Evaluation of a Tool for Assessing Teamwork among Biosystems Engineering Students. ASABE Meeting Paper #2300469.

Presentations

a) Davis, J.N. (2023). Evaluation of a Tool for Assessing Teamwork among Biosystems Engineering Students. ASABE Lightning Talk. AIM Conference, Omaha, NE.

b) Davis, J.N. (2020). Leaving with a Love for Life-long Learning: Lessons Learned. Recorded Video Presentation to the 2020 ASABE International Meeting. Innovations and Integrations for Instruction Technical Session.

c) Dougherty, M., Davis, Jeremiah, Davis, J.N. (2018) How e-portfolio helps students bridge the gap between short-term employment goals and long-term outcomes for pre-professionals. Conversations in Celebration of Teaching. Auburn University.

Invited Speaker and Guest Lectures

a) Davis, J.N. 2024. Speaker – Elevated Education Exchange, Auburn University.

b) Davis, J.N. 2019. Panel Member on being a Minority Engineering Student, Auburn University Academic Excellence Program.

c) Davis, J.N. 2018. Panel Member on being a Minority Engineering Student, Auburn University Academic Excellence Program.

d) Davis, J.N. 2017. Invited guest lecturer – "Sustainability of Green Infrastructure" – ASABE State Section Meeting.

e) Davis, J.N. 2016. Invited guest speaker – Careers in Consulting Engineering, ASCE Student Chapter meeting.

f) Davis, J.N. 2015. Invited guest speaker – Careers in Consulting Engineering, ASABE Student Chapter meeting.

Professional Meetings/Workshops Attended

a) Teaching with AI @ Auburn. Online Course. Auburn University. 2024.

b) ASABE Annual International Meeting, Omaha, NE. July 7-10, 2023.

c) Rater Assistant – Office of Assessment – Annual Meta-Assessment Institute – 2023.

d) Rater Assistant – Office of Assessment – Annual Meta-Assessment Institute – 2022.

e) Rater Assistant – Office of Assessment – Annual Meta-Assessment Institute – 2021.

f) Participant – Fall Line Workshop, Biggio Teaching Center and Sustainability Minor - 2021

g) Participant – Office of Assessment – Annual Meta-Assessment Institute – 2018, 2019, 2020

h) ASABE Annual International Meeting, Virtual. July 29 – August 1, 2020.

i) ASABE Annual International Meeting, Boston, MA. July 7 – July 10, 2019.

j) ASABE State Section Meeting, Auburn, AL 2019.

k) Participant – Biggio Teaching Center Course RE-design – 2018, 2019

l) Participant – Office of University Writing e-portfolio Assessment Institute – 2018.

m) ASABE Annual International Meeting, Detroit, MI. July 29 – August 1, 2018

n) ASABE State Section Meeting, Auburn, AL 2018.

o) ASABE State Section Meeting, Auburn, AL 2017.

p) New Faculty Orientation, Auburn, AL 2017.

9. Other Contributions to Teaching

Products developed for teaching. (Cross-listed in C. Outreach)

- *BSEN 3D printing lab:* Since 2018, the BSEN 3D printing lab has purchased and installed 10 3D printers. The printers use fusion deposition modeling with plastic filament and can print a variety of object sizes. The printers have been incorporated for instructional use in four courses so far, BSEN 2210, BATM 3100, and BSEN 4310, and BATM 4310. The printers allow for rapid prototyping, and greatly enhance project-based learning by allowing students to create objects quickly that they ordinarily would not have the time (or skill) to create using traditional machining methods. This also helps students who are learning CAD. I maintain the printers, setup the lab, and help instructors incorporate their use into courses. Added 8 new Prusa printers in 2024.

- *3D Augmented Reality Sand Table:* Utilizing a projector, computer program, overhead sensor, and a small table filled with sand, the 3D Sand Table projects a topographic color-banded map onto the surface of sand. The map image updates based on how high (or low) the sand is, and even adds 'water drop' feature to show rainfall and runoff collecting in low points. The sand table is a powerful visual demonstration to show how topography affects water flow and is used as an outreach and educational display, as well as in several courses: BSEN 3230 and BSEN 5450. Students can quickly understand how to interpret topography, and the concepts of land grading and drainage. Table was developed based on open-source plans provided from Stanford University. I provided the initial suggestion, as well as some design input, and recommendations for incorporating into coursework.

- *Implementation of Life-long Learning modules into BSEN curriculum:* Beginning in 2019, it was recognized that BSEN students needed additional reinforcement as to the importance of continuing education beyond college, also referred to as 'lifelong learning'. Working with Dr. Oladiran Fasina, several modules and assignments were

developed for incorporation into courses at the sophomore, junior, and senior level. The assignments focused on helping students develop an appreciation for learning outside of the classroom and getting students to attend learning activities in areas beyond those related to engineering. Students were tasked with reflecting on their outside learning through writing and incorporating some experiences into their on-going E-portfolio.

- *Expansion of BSEN Computing Lab:* Assisted in writing proposal for funding from College of Agriculture and AU Facilities to expand the computer lab in Corley Building from roughly 25 seats to 60. The existing lab was becoming cramped and small, and many courses were forced to split their labs into 2 sections to accommodate all the students. The space between computers was inadequate and the AC and ventilation were poor, students often complained about the hot (or cold) nature of the room. To alleviate this, it was proposed to expand the lab, which sits on the 3rd floor of Corley building on the north end, by removing some walls and using space formerly occupied by graduate student offices. Renovations were completed in 2019 and included new furniture, computers, improved air conditioning systems, video monitors, and enhanced audio/video controls. I also worked with Dr. Fasina on the layout and orientation of the room, as well as provided some feedback during the design process with Facilities architects.

Excellence in Teaching and Instruction:

- *Production of educated and* academically *well-rounded students, and placement of those students into relevant positions in the job market.*
  - Assist seniors in finding positions, liaison with companies who are hiring, and write letters of recommendation. Provide general career advice to any undergraduate students. Work to improve student resumes.
  - Wrote and provided over 150 letters of reference for students entering the job market, seeking scholarships, applying for internships, and applying for entry to graduate school. *approximate.

Type of reference	**Number written***
Graduate School	50
Job / Internship / Summer REU	55
Scholarship	40
EIT / Prof. Engineer	15

- *Contributions to curricula or* program *development that may include evidence of incorporating new knowledge and developments in the field*
  - Revisions to BATM program curriculum and pre-requisites to revise program to be better suited for undergraduate students. (2020)
  - Committee member – development of Biological & Agricultural Systems Technology curriculum assisted peers in development of new curriculum, naming of program for engineering technology program. Curriculum includes 4-5 new courses. (2017)

- *Creativity in course or program development*
  - Developed online asynchronous Canvas course (URISE) for undergraduates to learn more about graduate school and research. (2023-present)
  - Worked on team to develop unique career-focused writing program (Next Level) that was implemented on across every College of Engineering curriculum. (2022-present)
  - Developed permanent Canvas page for BSEN and BATM students for CAD related resources including instructional videos, web resources, and discussion forums. (2019)
  - Helped develop a unique class (BATM 3100) for teaching computer aided design (w/ M. Dougherty) (2018)
  - Developed additional CAD instruction modules for BSEN students who wanted to learn additional CAD. (2018)
  - Implemented unique "lifelong learning" activities (w/ O. Fasina) in BSEN 2210 and BSEN 3310 to promote student appreciation for lifelong learning (SLO 7) (2018)
  - Developing Panopto video lessons on Computer Aided Design (CAD) for use in multiple BSEN and BATM courses. (ongoing)
  - Re-designed AGRI 1000 Introduction to Agriculture to focus on modern agricultural concepts, future issues in agriculture, and current research topics based on CoAg research units. Integrated use of Canvas and "flipped" classroom techniques, as well as changed assignments to be more on a freshman-sophomore level. (2018)
- Incorporation *of new and or/innovative materials, ideas, concepts and techniques*
  - Introduced gamification into ENGR 2050 Statics class, where students are challenged to solve problems as part of a "game show". (2022-present)
  - Revised BSEN 3230 to meet requirements for inclusion in the Sustainability Minor (2021)
  - Revised numerous course elements to be taught and administered online for appropriate remote instruction during COVID-19 pandemic (2019-2020)
  - Incorporated Lifelong learning modules into BSEN 2210 and BSEN 4300 (2019)
  - Added 3D printing to BSEN 2210 course to help teach engineering design process. (2018)
  - Re-designed AGRI 1000 course to include "flipped" learning modules delivered online. (2018)
  - Converted and re-developed BSEN 2210 to a team project-based, active learning class. Revised course material and developed new labs, lectures, and projects. (2017)
- *Development of improved laboratory exercises or classroom demonstration*

- Developed 3 new lab exercises for use in BSEN 2210 including use of 3D printing.
- Developed 7 new lab exercises for BSEN 5560
- Developed 2 new open channel hydraulics labs for BSEN 3230.
- Implemented 6 new 3D printers to department for instructional purposes. Currently used by 3 BSEN courses and 1 BATM course.
- Developed lab exercise and assessment for Augmented Reality Sand Table for BSEN 3230 to help students better understand topography, watersheds, grading and drainage concepts

- *Experiential learning opportunities*
  - URISE Program Administrator (2023-present)
  - Co-Advisor to Auburn Entry of EPA Rainworks Challenge team (Fall 2020)
  - Advisor to Quarter Scale Tractor Design team (Fall 2018-present)
  - Advisor to ASABE Ethics Essay Competition (Fall 2017-present)
  - Advisor to BSEN 4310 Senior Design teams (Fall 2017 -present)
- *Improvements in student learning*
  - Proposed and implemented having all BSEN seniors take the Fundamentals of Engineering Exam as part of requirement for BSEN 4310 course. (Fall 2019)
  - Implemented URISE program within department.
- *Obtaining new equipment or resources that allow for improvement of course materials*
  - Purchased desktop turbidity meter for use in BSEN 2210. Purchased 4 additional 3D printers for lab use in multiple courses. (Fall 2023)
  - Purchased handheld pH and turbidity meters for field measurement use in BSEN 3230. (Fall 2019)
  - Worked to purchase 4 new 3D printers for undergraduate use in department. (Spring 2018)
  - Assisted in obtaining undergraduate student toolboxes for use in a range of courses when students need tools to work on in-class projects. (Fall 2017)
- *Other*
  - Development and publishing of undergraduate student handbook. (2017)
  - Advising students in Senior Design
    - 2020 – Parkerson Mill Creek Stream Trash Collector, AU Facilities / Opelika Floral Park Stormwater Management, City of Opelika.
    - 2019 – Site Design of "AU Green Infrastructure Institute" on proposed campus site, College of Agriculture.

- 2018 – Parkerson Mill Creek / Biggio Drive Multi-use path and stream bank stabilization & improvement, Auburn University Facilities
- 2017 – Yarbrough Elementary School Energy project, Adhikari Backyard Drainage project

Evidence of Scholarship of Teaching:

- *Development of instructional products adopted by peers*
  - Part of team that developed over 25 career-readiness assignments that were adopted and used by faculty throughout the college of engineering. (2022-present)
  - Developed departmental standard for homework and report submission. (2020)
  - Developing Teamwork Module for use in department to improve ABET SLO 4. (2019)
  - Co-developed life-long learning program for use throughout curriculum (w/ J.Davis and O. Fasina) (2019)
  - Developed life-long learning rubric to be used for assessment of ABET SLO 7. (2019)
  - Developed departmental rubric to be used for design drawings. Used in BSEN 2210, 4300, and 4310. (2018)
- *Pedagogical innovation adopted by peers*
  - Next Level career readiness assignments developed have been utilized by thousands of engineering students.
  - Teamwork assessment tool is widely used among departmental faculty.
  - Along with Dr. Brendan Higgins, helped advance adoption of Mentimeter and Kahoot web-based teaching feedback among other BSEN faculty.
  - Assisted in spring 2020 effort of converting courses to different instructional modes for pandemic, in particular advising fellow faculty on best practices for using Canvas
- *Excellent student performance in scholastic collegiate competitions*
  - 1st Place in Bioethics Essay competition at ASABE International meeting Sydney Williford (2020)
  - 1st and 3rd Place in Bioethics Essay competition at ASABE International meeting Hannah Thomascall and Meg Anderson (2019)
  - 1st and 3rd Place in Bioethics Essay competition at ASABE International meeting LeeAnn Johnston and Cami Shands (2018)
- *Curriculum that is accepted by peers*
  - Prepare and update annual undergraduate program Assessment Report
    - Office of Assessment "exemplary" report grade 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024.

- *Students who exit courses or other educational experiences with a high level of competence, validated by student awards, competitive internships and jobs, professional experience (ex. Presentations at research conferences), or proficiency in subsequent courses*
    - 84% job placement rate for Class of 2024, 37% passed FE exam
    - 91% job placement rate for Class of 2023, 40% passed FE exam
    - 75% job placement rate for Class of 2022, 32% passed FE exam
    - 81% job placement rate for Class of 2021, 29% passed FE exam
    - 82% job placement rate for Class of 2020, 53% passed FE exam
    - 82% job placement rate for Class of 2019, 72% passed FE exam
    - 88% job placement rate for Class of 2018, 75% passed FE exam

Other

- *Advisor – ASABE Annual Rally (Southeast Region)* - 2024
- *Advisor – ASABE Annual Rally (Southeast Region)* - 2019
- *Representative- Graduation, BSEN Department – 2019*
- *Affiliated Faculty of the Office of University Writing - 2018*

b. Outreach

I do not have a formal appointment in extension. However, the main goal of my outreach activities is to contribute to the collective outreach effort of Auburn University to bring campus and community together and to enrich the life of both. I look for opportunities every year to volunteer for any STEM-education related activities for all age ranges of students. I love to teach and helping to instill a love for science in students is a priority for me.

1. Instructional Activities

- Member, Auburn Makes Organization (2020 - 2024) Formed in 2020 as a small group of faculty and staff who were interested in manufacturing PPE to help local medical staff with COVID-19, Auburn Makes expanded to include members of the University in several different departments and libraries who were part of the 'maker' community who utilize additive manufacturing techniques to rapid prototype and build. As part of this group, I helped with teaching an online instructional unit to middle school STEM students at two schools in Huntsville, AL.

2. Technical Assistance

Local activities

- 2020. Advised Mr. Dan Ballard with City of Auburn Watershed Management on how to use sight gauges to measure water level in rainwater storage system.
- 2019. Advised local consultant on legal easement issues on residential development project in Columbus, GA.
- 2018. Advised Mr. Dan Ballard with City of Auburn Watershed Management on contract issues for a local project on a dispute between the city and the contractor.

National activities

None

International activities

- 2018-present. Informally advised students in AU Chapter of Engineers Without Borders on their projects in Africa and South America.

3. Outreach Publications

None

4. Electronic Products

None

5. Other Outreach Products

1. **3D Augmented Reality Sand Table:** Utilizing a projector, computer program, overhead sensor, and a small table filled with sand, the 3D Sand Table projects a topographic color-banded map onto the surface of sand. The map image updates based on how high (or low) the sand is, and even adds 'water drop' feature to show rainfall and runoff collecting in low points. The sand table is a powerful visual demonstration to show how topography affects water flow and is used as an outreach and educational display, as well as in several courses: BSEN 3230 and BSEN 5450. Students can quickly understand how to interpret topography, and the concepts of land grading and drainage. Table was developed based on open-source plans provided from Stanford University. I provided the initial suggestion, as well as some design input, and recommendations for incorporating into coursework.

SERVICE

Service to the University

- Member, Teaching Effectiveness Committee. 2023-present
- Member, Non-Tenure Track Faculty Committee. 2020-present
- Member and Co-Founder, Auburn Makes. 2020-2023
- Member, Search Committee – Office of Academic Assessment. 2020
- Judge, University Council of Engineering Graduate Student Research Poster Competition. 2019, 2020.

Service to the College

- Member, Engineering Safety Committee – College of Engineering. 2018 – 2020
- Member, Continuous Improvement Committee – College of Engineering. 2017-present
- Member, Curriculum Committee – College of Engineering. 2017-present
- Member, Curriculum Committee – College of Agriculture. 2017-present
- Judge, College of Agriculture Graduate Student Research Poster competition. 2018, 2019, 2020, 2024

Service to the Department

- Undergraduate Program Coordinator (2017 - present): Major responsibilities and accomplishments as undergraduate program coordinator include the following:
  - Oversee and create the annual Academic Assessment Reports for the undergraduate program and Master's program.
  - Assist in creating and writing the Academic Assessment Reports for the PhD program.
  - Respond to questions from Biosystems Engineering faculty and students regarding curriculum issues.
  - Respond to curriculum and bulletin issues from the university (including the College of Agriculture and Samuel Ginn College of Engineering).

- Visit with students that are interested in transferring to Biosystems Engineering (approximately 5 per semester).

- Curriculum Coordinator, Biosystems Engineering (2017 - present). In addition to the responsibilities and accomplishments listed under the Undergraduate Program Coordinator section above, other activities as Curriculum Coordinator include:
  - Coordinate approval and review of any new proposed courses or revisions to existing courses in all 5 curriculum programs in the department.
  - Chair and organize the departmental curriculum committee.
- Member, Corley Computer Lab Renovation Committee. Assisted Dr. Fasina in the planning and implementation of an expansion and renovation of the main undergraduate computer lab in Corley. Expanded the lab from 25 to over 57 seats. 2019.
- Advisor, Student Branch of Alabama Section of ASABE, 2018-present.
- Member, Departmental E-day Activities Committee, 2017-present.
- Member, BSEN 100-year History Book Development Committee, 2018.
- Member, BSEN 100-year Anniversary Planning Committee, 2018-2019.
- Member, Research Engineer Search Committee, 2019.
- Member, Lecturer in Machine Systems Search Committee, 2024.
- Member, Academic Advisor Search Committee, 2023.
- Chair, Biosystems Engineering Academic Advisor Search Committee, 2018.

Professional Service

Society Membership

- Member, American Society of Engineering Education. 2019- present.
- Member, National Society of Professional Engineers. 2008 - present.
- Member, National Science Teachers Association. 2020 – present.
- Professional Engineer, State of Florida. 2009 - 2017.
- Professional Engineer, State of Georgia. 2008 – 2021.
- Professional Engineer, State of Alabama. 2007 - present.
- Member Engineer, American Society of Agricultural and Biological Engineers(ASABE). 1998 -present.

Service Activities

- Membership Committee, ASABE State Section (Alabama) 2020-present.

Manuscript Review – list of journals

- American Society of Engineering Education, Agricultural and Biological Division (total of 30 manuscripts in 2019 - 2023).

Software Experience

Engineering

- Expert User – Autodesk Civil 3D (23 years)
- Expert User – ESRI ArcMap / ArcGIS Pro (24 years)
- Skilled User – Autodesk Fusion 360 (7 years)
- Skilled User – Bentley OpenFlows Products (20 years)

Teaching

- Expert User – Canvas LMS (8 years)
  - Managed 7 courses (5 current, 2 past) over 8 year period
  - Created and manage 2 standalone asynchronous courses
  - Converted 3 courses to remote, online, asynchronous for Distance Education
- Expert User – Banner (8 years)
- Expert User – Qualtrics (8 years)
- Skilled User – DegreeWorks (8 years)
- Skilled User – Advise Assist (8 years)
- Skilled User – CourseLeaf Curriculum Management System (8 years)