University Council

March 10, 2023

<u>UNIVERSITY CURRICULUM COMMITTEE – 2022-2023</u>
Susan Sanchez, Chair
Agricultural and Environmental Sciences – Kylee Duberstein
Arts and Sciences – Jonathan Haddad (Arts)
Rodney Mauricio (Sciences)
Business – Jim Carson
Ecology – Amanda Rugenski
Education – David Jackson
Engineering – Kun Yao
Environment and Design – Ashley Steffens
Family and Consumer Sciences – Sheri Worthy
Forestry and Natural Resources – Joseph Dahlen
Journalism and Mass Communication – Dodie Cantrell-Bickley
Law – Randy Beck
Pharmacy – Michelle McElhannon
Public and International Affairs – Rongbin Han
Public Health – Pamela Orpinas
Social Work – Harold Briggs
Veterinary Medicine – Shannon Hostetter
Graduate School – Christof Meile
Ex-Officio – Provost S. Jack Hu
Undergraduate Student Representative – Kate Lindgren
Graduate Student Representative – Yehia Abdelsamad

Dear Colleagues:

The attached proposal from the College of Engineering to offer a new major in Civil and Environmental Engineering (Ph.D.) will be an agenda item for the March 17, 2023, Full University Curriculum Committee meeting.

Sincerely,

Susan Sanchez, Chair
cc: Provost S. Jack Hu
Dr. Marisa Pagnattaro

UNIVERSITY SYSTEM OF GEORGIA

USG Academic Degree Program Application

Released

December 3, 2021

Version Control

Date	*Changes*	*USG Approved date*	*Website update date*
12-18-2020	*Revised question 34 and 61 for clarity; Revised question 47 to include part b with the tuition comparison table for peer or competitive programs; reworded question 49 to include costs and benefits per fee; Revised question 50 related to additional costs to students; Revised question 51 to clarify the question related to indirect costs.*		

NOTE:

Italicization indicates a question or field on the in-take form

^= indicates accreditation related content

<u>USG Routing</u>

- ☐ *Program was part of the Annual Academic Forecast*
- ☐ *This proposal can be expedited (Nexus, established concentration with strong enrollment)*
- ☐ *This proposal requires USG integrated review*

USG ACADEMIC PROGRAM APPLICATION

A. OVERVIEW

To be completed as part of SharePoint Submission

1. *Request ID: (SharePoint Generated unique ID)*

2. ***Institution Name:*** *University of Georgia*

3. ***USG Sector:*** *Research University*

4. ***School/Division/College:*** *College of Engineering*

5. ***Academic Department:*** *School of Environmental, Civil, Agricultural, and Mechanical Engineering*

6. ***Proposed Program Name:*** *Doctor of Philosophy with a major in Civil and Environmental Engineering*

7. ***Major:*** *Civil and Environmental Engineering*

8. ***CIP Code (6 digit):*** *14140101*

9. ***Degree Level:*** *Doctoral*

10. ***Anticipated Implementation Semester and Year^:*** *Fall 2023*

11. ***Was this program listed in the most recent Academic Forecast?***

    ☒ *Yes*

    ☐ *No (If no, explain why below)*

12. ***Program Description***
    (Provide a description of the program to be used in the Board of Regents meeting packet):

Civil and environmental engineering focuses on creating and maintaining a resilient, sustainable built environment while protecting and sustaining the natural environment. Civil and environmental engineers are essential to providing the necessities of human life, including clean water and air, energy, infrastructure (e.g., buildings, roads, bridges, tunnels, rails, dams, shelter, etc.), among others.

The recent advancement in science and technologies, enabling innovative solutions that were not possible before, has transformed engineering fields in many ways. As society becomes more and more interconnected and modernized through the adoption of inventions and technologies, new challenges continue to emerge that need to be properly addressed by the new generations of civil and environmental engineers. These include, but are not limited to, resilience and sustainability of infrastructure, climate change and changing environments, emerging automation (e.g., autonomous vehicles) in moving peoples and goods, renewable energy, air quality, safe drinking water and sanitation, and natural and man-made hazards. Addressing these grand challenges requires interdisciplinary knowledge and innovative approaches arising from convergent research across multidisciplinary fields. In addition, the interdependence of these challenges calls for a more holistic approach to catch the emerging and adaptative characteristics of the various systems involved. As such, broadening the traditional civil and environmental engineering curriculum to incorporate recent developments in interdisciplinary and system studies fields (e.g., data science, machine learning and artificial intelligence, cyber-physical systems, etc.) becomes a pressing need in order to provide a well-prepared workforce in the evolving civil and environmental field. There is a high demand for talents in the field for meeting the aforementioned challenges. The U.S. Bureau of Labor Statistics projects 8% growth in civil engineering and 4% growth in environmental engineering over the next decade[1].

The proposed Ph.D. program in Civil and Environmental Engineering is committed to addressing the strategic goals and critical needs of the University of Georgia, the State of Georgia, and the United States in civil and environmental engineering research and education. The $1.2 trillion U.S. infrastructure bill[2] recently signed by President Biden highlights the importance of infrastructure to the nation's economy and global competitiveness. As a public land-grant and sea-grant research university in the state of Georgia, the University of Georgia with its current strengths in engineering and sciences has the unique capability to implement a rigorous, broadly based civil and environment engineering program to meet societal needs and become a U.S. leader in this critical discipline.

In the past decade, the University of Georgia has made tremendous progress in growing its engineering programs. With the establishment of its College of Engineering and School of Environmental, Civil, Agricultural, and Mechanical Engineering, the major in Civil and Environmental Engineering has been successfully developed and implemented at the bachelor's and master's levels for several years. The School of Environmental, Civil, Agricultural and Mechanical Engineering has the infrastructure, research, and educational resources and experience to further advance its civil and environmental engineering program at the doctoral level. In fact, this program is already being offered as a concentration under Engineering (Ph.D.) with great success, and the move to an independent major is predicted to only strengthen the program.

13. Accreditation^: Describe disciplinary accreditation requirements associated with the program (if applicable, otherwise indicate not applicable).

Not applicable

14. Specify SACSCOC or other accreditation organization requirements^. Mark all that apply.

☐ Substantive change requiring notification only [3]

☐ Substantive change requiring approval prior to implementation [1]

☐ Level Change [2]

X None

[1] See page 17 (Requiring Approval Prior to Implementation) of SACSCOC Substantive Change Policy and Procedures document.
[2] See page 3 (Level Change Application) of SACSCOC Seeking Accreditation at a Higher or Lower Degree Level document for level change requirements.

STRATEGIC PLAN

15. How does the program align with your institutional mission and function^?
If the program does not align, provide a compelling rationale for the institution to offer the program.

One of the missions of the University of Georgia (UGA) is its commitment to excellence in public service, economic development, and technical assistance activities designed to address the strategic needs of the state of Georgia. The Civil and Environmental Engineering (Ph.D.) program will fit the mission of the University of Georgia as it provides graduates who will meet the demand for multidisciplinary expertise in novel design and operations of intelligent infrastructure systems, sensing, automation, Internet of Things, data mining, data-driven decision making, and artificial intelligence (AI) applications, as well as in grand challenge areas such as resilient and sustainable communities and infrastructure. This echoes the ongoing cluster hiring effort[4] at UGA in the area of Resilient Infrastructure for Sustainability and Equity (RISE), which aims to unite and catalyze strengths in data science, engineering (including Engineering With Nature®, natural infrastructure, and green engineering), environmental and atmospheric sciences, urban systems, public service and outreach, public administration, and law and policy to establish UGA as an international leader in smart and resilient infrastructure systems that protect people, their livelihoods, and their communities from severe weather impacts, climate change, man-made hazards, pollution, unsafe or degraded infrastructures, and other disruptions. The RISE cluster will produce fundamental research on next generation infrastructure and systems with emphasis on vulnerable communities connected with important assets including critical transportation infrastructure, military installations, ports, and urban systems (e.g., water, wastewater, solid waste systems).

This program will support this mission of UGA by providing a well-trained workforce in civil and environmental engineering. In addition, this program will enhance other engineering programs, life and physical sciences, and public health programs at UGA.

16. How does the program align with your institution's strategic plan and academic program portfolio?
Identify the number of existing and new courses to be included in the program.

The University of Georgia's 2020 Strategic Plan states that "UGA is poised to address Georgia's most daunting issues: economic development and job creation, public health, and obesity."

The College of Engineering at UGA currently offers a Ph.D. in Engineering with areas of emphasis in Resilient Infrastructure Systems and Environment and Water. These areas of emphasis were developed as part of the initial graduate program in the College of Engineering when it was first formed in 2012. The long-term goal was to develop free-standing Ph.D. programs once a critical mass of students was enrolled. The faculty in the School of Environmental, Civil, Agricultural, and Mechanical Engineering believe a critical mass has now been reached, as shown from recent growth in Ph.D. student enrollment.

All 33 courses in the proposed major are currently being offered in the areas of emphasis under Engineering (Ph.D.), and no new courses or resources are required to transition the program content into an independent major.

[4] https://www.ugajobsearch.com/postings/228586

B. NEED

17. Was this proposal and the design of the curriculum informed by talking with alumni, employers, and community representatives?

☐ *No*

☒ *Yes (If yes, use the space below to explain how their input informed this proposal)*

The proposed Ph.D. program was discussed at College of Engineering IAB meeting in Fall 2022.
A letter of support from the members of the industry advisory board was obtained and is included in the appendix.

18. Does the program align with any local, regional, or state workforce strategies or plans?

☐ *No*

☒ *Yes (If yes, please explain below)*

Georgia has unparalleled options for cost-effective, efficient passenger and freight transportation due to its geographic location and decades of investments in infrastructure. Ranked No. 1 for infrastructure and access to global markets by Area Development, Georgia is home to the busiest airport in the world (Hartsfield-Jackson), and one of the busiest ports in the U.S. (Port of Savannah), and offers a robust rail and highway infrastructure. As a core economic sector in Georgia, transportation and utilities is projected to grow by 18.1 percent through 2028, the second fastest rate of all industry sectors. Professional and business services will add nearly 96,000 jobs, the second most of any industry sector in the state, by 2028. Construction jobs in Georgia will grow by 7.2 percent over the same projected period as construction of buildings, trade contractors, and heavy and civil engineering construction continue with infrastructure improvements to roads and bridges[5].

The projected growth of the economy will be incomplete without a concomitant level of investment in degree programs which can generate an engineering workforce in support of these key economic sectors. As a public land-grant and sea-grant research university in the state of Georgia, the University of Georgia with its strengths in interdisciplinary programs has the unique capability to implement a rigorous, broadly based civil and environmental engineering program to meet societal needs and become the U.S. leader in this critical discipline.

In the past decade, the University of Georgia has made tremendous progress in growing its engineering programs. The University established a comprehensive College of Engineering in 2012 and the School of Environmental, Civil, Agricultural and Mechanical Engineering in 2017. Civil and Environmental Engineering programs at the bachelor's and master's levels were developed over 10 years ago and have been successfully implemented. Enrollment in the undergraduate program has grown to a five-year moving average of 340 students. Since the School was formed in 2017, five new faculty have been hired and have been active in civil and environmental engineering research and teaching. The School of Environmental, Civil, Agricultural and Mechanical Engineering has the infrastructure, research and educational resources, and experience to further advance its civil and environmental engineering program at the doctoral level.

[5] https://explorer.gdol.ga.gov/vosnet/mis/Current/gaworkforcecurrent.pdf

19. Provide any additional evidence of regional demand for the program^ (e.g. prospective student interest survey data, community needs, letters of support from employers)

Georgia's vast geography and continuously increasing population, as well as the state's diverse mixture of urban, suburban, and rural areas and multiple sectors, demand a strong workforce in engineering. The aging infrastructure and recent infrastructure bill will put a tremendous demand for engineering workforce in Georgia. The strong partnerships between the UGA College of Engineering and industries have helped to produce a STEM workforce that is responsive and relevant to actual market needs. College of Engineering graduates consistently have 93-100% job placement rates in an industry with a median salary, according to the Bureau of Labor Statistics, of $84,000 per year.

The College of Engineering at UGA currently offers a Ph.D. in Engineering with areas of emphasis in Resilient Infrastructure Systems and Environment and Water. These areas of emphasis were developed as part of the initial graduate program in the College of Engineering when it was first formed in 2012. The long-term goal was to develop free-standing Ph.D. programs once a critical mass of students was enrolled. The faculty in the School of Environmental, Civil, Agricultural, and Mechanical Engineering believe a critical mass has now been reached, as shown from recent growth in Ph.D. student enrollment, from 98 students in 2020 to 117 students in 2022.

Anecdotal evidence obtained from current students indicates they prefer named majors as opposed to a generic major title in Engineering. Introducing a new Ph.D. major in Civil and Environmental Engineering will help recruit more graduate students and subsequently increase research productivity in this multidisciplinary field. It will also enable the school to attract and retain the most talented faculty who are focused on building a strong and sustainable research program.

Many of UGA's peer and aspirational schools and departments already have named majors in their disciplines (see section 23 below) and those that do not are moving away from generalized Engineering Ph.D. programs, such as the University of Nebraska. It is important for UGA to respond to national trends to maintain competitiveness when recruiting doctoral students. Based on enrollment numbers at other universities, the increase in enrollment in engineering at the University of Georgia, and the University's geographic location, faculty conservatively estimate 10-15 Ph.D. degrees conferred per year within five years.

20. Identify the partners you are working with to create a career pipeline with this program[3].^ Mark all that apply

☐ High School CTAE	☒ Other USG institutions	☐ Professional associations
☐ High School STEM	☐ Other universities	☒ Other (specify below)
☐ Career academies	☐ Employers	Developed in conjunction with the advisory board.
☐ TCSG programs	☐ Community partnerships	☐ None

[3] Provide letters of support and explain the collaboration and how partners will share or contribute resources. (Consider internal pipeline programs – "off-ramp program" Nursing to integrated health or MOUs for pathways with other USG institutions (pipelines – keep them in state for grad school if we can)

21. Are there any competing programs at your own institution?

☒ *No*

☐ *Yes (If yes, provide additional information about the competing program(s) below).*

This program's content is currently being offered as areas of emphasis under Engineering (Ph.D.). These areas of emphasis will be phased out after the approval of Civil and Environmental Engineering (Ph.D.).

22. What is the program's service area (local, regional, state, national)? If outside of the institution's traditional service area, provide a compelling rationale for the institution to offer the program. If the program's service area is a region within the state, include a map showing the counties in the defined region.

The program's service area is national. The program service area is used as the basis for labor market supply and demand analysis.

23. Do any other higher education institutions in close proximity offer a similar program?

☐ *No*

☒ *Yes (If yes, provide a rationale for the institution to offer the program)*

In Georgia, the Georgia Institute of Technology (Georgia Tech) is the only institution in the University System of Georgia to offer Civil Engineering (Ph.D.) and Environmental Engineering (Ph.D.) programs. While Georgia Tech has a track record of producing high quality civil and environmental engineering graduates in traditional curriculum settings, there is a great need for more engineers educated in broad engineering settings with necessary knowledge from other related fields such as artificial intelligence and data science as convergence increasingly plays a critical role in scientific discovery and solving vexing research problems, recognized by the National Science Foundation (NSF)[6]. (Please see a letter of support from the UGA Artificial Intelligence Institute in the Appendix). This proposed program will build on the distinctive cross-disciplinary strengths at UGA and offer students opportunities to collaborate on research projects with faculty in both the College of Engineering and the Franklin College of Arts and Science. In fact, faculty in the School of Environmental, Civil, Agricultural, and Mechanical Engineering actively participate in several interdisciplinary research centers that are unique to UGA such as the Institute for Resilient Infrastructure Systems, the New Materials Institute, Georgia Informatics Institutes for Research and Education, Institute for Artificial Intelligence, and the Engineering Education Transformations Institute.

Additionally, multiple engineering faculty at UGA actively collaborate with Georgia Tech on large, multi-institution grants, such as the NSF-funded Engineering Research Center for Cell Manufacturing Technologies. These collaborations build on complimentary expertise at both institutions and provide a comprehensive and convergent approach to addressing broad engineering challenges. A dedicated Civil and Environmental Engineering (Ph.D.) program at UGA would help recruit additional students to supplement these efforts.

[6] https://www.nsf.gov/od/oia/convergence/index.jsp

24. Based on the program's study area, what is the employment outlook for occupations related to the program, according to the CIP to SOC crosswalk in the Qlik IPEDS Application^? An Excel version of the CIP to SOC crosswalk is also available from NCES. If data for the study area is not available, then use state- or national-level data.

a. Click **here** for US and Georgia occupation projections.

b. Click **here** for 2026 Georgia Department of Labor data projections for the State or Georgia Workforce Board Regions in Qlik (link to GDOL Projections); data is also available through the GDOL Labor Market Explore Website.

c. For a custom Georgia geography, request a Jobs EQ report from **USG Academic Affairs office.**

Related Occupation	SOC code	Current Employment [2020]	Projected Employment [2030]	# Change	% Change	Average Annual Openings
Architectural and engineering managers	11-9041	197,800	205,900	14,700	4	1470
*Civil engineers	17-2051	309,800	335,100	25,000	8	2500
*Environmental engineers	17-2081	52,300	54,300	4,000	4	400
*Engineering teachers, postsecondary	25-1032	46,300	52,100	5,100	13	510

Note: * indicates the top three fields for graduate students

25. Using IPEDS data, list the supply of graduates in the program and related programs in the service area.^

A. Competitor Institutions Selected Based on Aspirational

a. National Level

Similar or Related Programs	CIP Code	Supply[1]	Competitor Institutions(Supply)[2]
Ph.D. in Engineering	14.0101	6	University of California-Berkeley (6)
Ph.D. in Civil Engineering	14.0801	135	University of Illinois Urbana-Champaign (36), The University of Texas at Austin (33), University of California-Berkeley (26), University of California-Los Angeles (14), University of Michigan-Ann Arbor (8), University of Wisconsin-Madison (7), University of Minnesota-Twin Cities (6), University of Virginia-Main Campus (5)
Ph.D. in Environmental and Environmental Health Engineering	14.1401	10	University of Illinois Urbana-Champaign (10), University of Michigan-Ann Arbor (6)

b. Southeastern Regional Level

Similar or Related Programs	CIP Code	Supply[1]	Competitor Institutions(Supply)[2]
Ph.D. in Engineering	14.0101	0	
Ph.D. in Civil Engineering	14.0801	5	University of Virginia-Main Campus (5)
Ph.D. in Environmental and Environmental Health Engineering	14.1401	0	

[1] Supply = Number of program graduates last year within the study area
[2] Competitors = List other institutions that offer this program or a similar program in the area (see **Question 23**). Competitor Institutions are selected in each category based on aspirational.

B. Competitor Institutions Selected Based on Peer

a. National Level

Similar or Related Programs	CIP Code	Supply[1]	Competitor Institutions(Supply)[2]
Ph.D. in Engineering	14.0101	1	Indiana University-Bloomington (1)
Ph.D. in Civil Engineering	14.0801	199	Purdue University-Main Campus (34), Virginia Polytechnic Institute and State University (30), Iowa State University (25), North Carolina State University at Raleigh (19), University of California-Davis (18), University of Maryland-College Park (18), University of Florida (16), Michigan State University (14), University of Missouri-Columbia (11), Ohio State University-Main Campus (6), University of Kentucky (4), University of Iowa (3), Stony Brook University (1)
Ph.D. in Environmental and Environmental Health Engineering	14.1401	19	University of Florida (9), University of Arizona (7), Purdue University-Main Campus (1), University of Iowa (1), Michigan State University (1)

b. South Eastern Regional Level

Similar or Related Programs	CIP Code	Supply[1]	Competitor Institutions (Supply)[2]
Ph.D. in Engineering	14.0101	0	
Ph.D. in Civil Engineering	14.0801	69	Virginia Polytechnic Institute and State University (30), North Carolina State University at Raleigh (19), University of Florida (16), University of Kentucky (4)

Ph.D. in Environmental and Environmental Health Engineering	14.1401	9	University of Florida (9)

[1] Supply = Number of program graduates last year within the study area

[2] Competitors = List other institutions that offer this program or a similar program in the area (see **Question 23**). Competitor Institutions are selected in each category based on peer.

26. Based on the data provided in questions 24 and 25, discuss how this program will help address a need or gap in the labor market?^

The new wave of innovation driven by artificial intelligence, automation, Internet of Things, cyber-physical systems, etc., will continue to transform various engineering fields. The Civil and Environmental Engineering (Ph.D.) program is timely for preparing professionals and experts for this evolving engineering field and for meeting present and emerging engineering needs for the local and regional engineering industries.

According to Georgia workforce trend analysis over 10-year period (2018-2028)[7], transportation and utilities will grow by 18.1 percent at the second fastest rate of all industry sectors. Professional and business services will add nearly 96,000 jobs. Construction jobs in Georgia will increase by 7.2 percent as construction of buildings, trade contractors, and heavy and civil engineering construction continues with infrastructure improvements to roads and bridges. Transportation and material moving occupations are expected to add nearly 49,000 new jobs. Careers in science, technology, engineering, and mathematics,- commonly referred to as STEM occupations, - will grow by over 95,000 new jobs in Georgia through 2028.

With a highly educated workforce, renowned research institutions, cutting-edge technological resources, and global access through the Hartsfield-Jackson International airport, Georgia attracts billions in federal and private dollars. For example, Brightmark will build the nation's largest plastic waste processing plant outside of Macon, a facility that eventually could offer a solution to one of the country's most visible and pressing environmental problems—plastic pollution[8]. Microsoft announced plans for a new datacenter region with a presence in Douglas and Fulton counties and purchased a 90-acre parcel of land to house a future campus at Quarry Yards and Quarry Hills on the Westside[9].

To sustain such a strong growth and technological innovation, the needs for civil and environmental engineering graduates which have broad training in engineering and cross-disciplinary fields for local and regional employers are increasing significantly. The proposed Civil and Environmental Engineering (Ph.D.) would provide a supply of engineers to address these local and regional needs. A credential in "Civil and Environmental Engineering" provides graduates with an advantage of those with a general "Engineering" degree, as industry partners often look for the specification in title.

[7] https://explorer.gdol.ga.gov/vosnet/mis/Current/gaworkforcecurrent.pdf

[8] https://www.ajc.com/news/massive-georgia-plant-to-turn-plastic-into-fuels-chemicals/BMU4MANAWNDRDANUNRH62CHAAM/

[9] https://news.microsoft.com/Microsoft-Atlanta/

27. Using data from *O*-Net,* identify the average salary for the related occupations identified in question 24. Then list at least three technical skills and three Knowledge, Skills and Abilities (KSAs) associated with the related occupations. This information can be found using onetonline.org. (Standard Occupation Code = SOC)

SOC Code (6 digit)	Average Salary (O-Net data)	Occupation specific technology skills & KSAs
11-9041	$71.89 hourly, $149,530 annual	https://www.onetonline.org/link/summary/11-9041.00
17-2051	$42.58 hourly, $88,570 annual	https://www.onetonline.org/link/summary/17-2051.00
17-2081	$44.29 hourly, $92,120 annual	https://www.onetonline.org/link/summary/17-2081.00
25-1032	$103,600 annual	https://www.onetonline.org/link/summary/25-1032.00

Notes:

28. Using GOSA Earning and Learnings data, what is the typical salary range 5 years after graduation from the program?

Average Salary	75th Percentile	50th Percentile	25th Percentile
1 year after graduation	N/A	N/A	N/A
5 years after graduation	N/A	N/A	N/A

Provide any additional comments, if needed:

No data is available for Ph.D. engineering graduates from GOSA Earning and Learning data.

29. Based on the data compiled and analyzed for this section (see Section C: Need), what is the job outlook for occupations filled by students with this degree?^

The civil engineering market size was valued at over $9 trillion in 2018 and will exhibit growth at over 4% per year from 2019 to 2025 and is expected to be worth over $12.5 trillion by 2025[10]. The environmental technology market is estimated at $552.1 billion in 2021 and is projected to reach $690.3 billion by 2026, at a compound annual growth rate of 4.6% from 2021 to 2026[11]. Georgia is expected to add over 8,000 jobs in architecture and engineering from 2018 to 2028. The investment in renovating the aging infrastructure and adopting new technologies is anticipated to drive market growth in transforming the traditional civil and environmental field, which demands for well-trained professionals with a Ph.D. degree.

[10] https://www.gminsights.com/industry-analysis/civil-engineering-market
[11] https://www.marketsandmarkets.com/Market-Reports/environmental-technology-market-109682606.html

C. CURRICULUM

30. Enter the number of credit hours required to graduate.^

72

31. Are you requesting a credit hour requirement waiver (either below or above traditional credit hour length requirements as prescribed by the University System of Georgia? See section 2.3.5 (Degree Requirements) of the USG Board of Regents Policy Manual here for more information).

☒ *No*

☐ *Yes (*If yes, explain the rationale for the request in the space below*)*

32. Related to SACSCOC accreditation, specify if the program format of the proposed program is a^:

Format (Check 1)		50% or more of the program is delivered online
☐	Combination of on-campus and online	☐ Yes
☐	Combination of off-campus and online	☐ Yes
☐	Hybrid, combination delivery	☐ Yes

33. Is the program synchronous or asynchronous?[4] Mark one of the options below.

☐ Synchronous

The majority of courses are offered at scheduled, pre-determined times with students connecting to a virtual room or location and interacting with faculty and fellow students via web/video conferencing platform.

☐ Asynchronous

34. For associate's, Nexus, and bachelor's degree proposals, which High Impact Practices[5] (HIPs) will faculty embed into the program? Mark all that apply.

☒ First-Year Experiences

☐ Common Intellectual Experiences

☐ Learning Communities

☐ Writing-Intensive Courses

☒ Collaborative Assignments and Projects

☐ Undergraduate Research

☒ Diversity/Global Learning

☐ ePortfolios

☒ Service Learning, Community Based Learning

☐ Internships

☐ Capstone Courses and Projects

[4] See SACSCOC Handbook for Institutions Seeking Initial Accreditation here.

[5] See Kuh (2008). High-Impact Practices: What They Are, Who Has Access to Them, and Why They Matter. *Association of American Colleges and Universities*, *14*(3), 28-29).

35. Discuss how HIPs will be embedded into the program? Your discussion should provide specific examples and include whether the HIP is required or an optional component. It should also indicate at what point the experience is offered or required.

(i.e. "Students will be required to participate in an externship during their third year of enrollment, in order to develop skills in… etc.").

Students will be required in the first-year of the program to attend a structured orientation program; complete initial coursework which provides students with a strong foundation in their field and help them develop key skills such as critical thinking and problem-solving; be assigned a mentor who can help navigate their program, provide guidance on academic and research issues, and connect them with other resources and opportunities; attend workshops and seminars on a variety of topics, such as grant writing, communication skills, and professional development, to help Ph.D. students prepare for their future careers.

Collaborative assignments and projects are a valuable component of a Ph.D. program in civil and environmental engineering by providing students with opportunities to work together and build important skills. Some ways that collaborative assignments and projects can be embedded into a Ph.D. program in civil and environmental engineering include team-based research projects, group-assignment, peer mentoring, interdisciplinary projects, etc.

36. Does the program take advantage of any USG initiatives?
Mark all that apply, and provide a letter of support from applicable initiatives' leadership.

[ ] eCampus *[ ] Georgia Film Academy*

[ ] FinTECH *[ ] Other: Specifiy Initiative Here*

37. ^For associate's, Nexus, and bachelor's degree proposals, list the specific occupational technical skills, and KSAs identified in question 27 and show how they related to the program learning outcomes. Insert more rows as needed.

Complete this chart for the upper division or major curriculum only.

Alignment of Occupational KSAs [1]	Student Learning Outcome (s)	Direct Measure (s)	Data Source
Critical Thinking	Ability to identify problems and develop economically feasible solutions through critical thinking	Course assignments and exams; Research projects; Capstone projects; Direct observation from major professors.	Exams; Research project
Complex Problem Solving	Ability to perform efficiently in an interdisciplinary team as a member or as a leader to create a collaborative environment, integrating concepts, and techniques to solve challenging civil and environmental engineering problems	Course assignments and exams; Research projects; Capstone projects; Direct observation from major professors.	Course assignments; Research project
Coordination and Social Perceptiveness	Demonstrate the ability to effectively communicate experimental results orally with a range of audiences and exhibit efficient writing skills demonstrated through scientific publications and grant proposals	Faculty evaluation; Self-assessment; Mentor evaluations; Career development activities; Graduate surveys.	Faculty evaluation; graduate survey
Active Learning	Ability to identify problems and develop economically feasible solutions through critical thinking, scientific knowledge, engineering tools, and systematic approaches related to advanced civil and environmental engineering field	Course assignments and exams; Research projects; Capstone projects; Direct observation from major professors.	Research projects; Faculty evaluations
Writing	Demonstrate the ability to effectively communicate experimental results orally with a range of audiences and exhibit efficient writing skills demonstrated through scientific publications and grant proposals	Writing assignments such as research papers or technical reports; Presentations such as research seminars or project presentations; Peer and faculty evaluation;	Research project; Presentations; Technical reports
Engineering and Technology	Ability to perform efficiently in an interdisciplinary team as a member, integrate concepts, and techniques to solve challenging civil and environmental engineering problems.	Hands-on projects involving Digital technologies; Examinations such as programming skills; Faculty evaluation during the research meetings; Industry certifications	Hands-on project; Programming project; Presentations

[1] Direct measures may include assessments, HIPs, exams, etc.

38. For associate's, Nexus, and bachelor's degree proposals, fill in the table below to demonstrate the link between the learning outcomes and NACE career ready competencies.

Insert more rows as needed.

Career Ready Competencies (NACE)	Student Learning Outcomes	Direct Measure (s)[1]
Critical Thinking/Problem Solving	Ability to identify problems and develop economically feasible solutions through critical thinking	Course assignments and exams; Research projects; Capstone projects; Direct observation from major professors.
Oral/Written Communications	Demonstrate the ability to effectively communicate experimental results orally with a range of audiences and exhibit efficient writing skills demonstrated through scientific publications and grant proposals.	Writing assignments such as research papers or technical reports; Presentations such as research seminars or project presentations; Peer and faculty evaluation;
Team Work/ Collaboration	Ability to perform efficiently in an interdisciplinary team as a member or as a leader to create a collaborative environment	Group projects; Peer and faculty evaluations; Case studies or simulations for complex problems.
Digital Technology	Ability to perform efficiently in an interdisciplinary team as a member, integrate concepts, and techniques to solve challenging mechanical engineering problems.	Hands-on projects involving Digital technologies; Examinations such as programming skills; Faculty evaluation during the research meetings; Industry certifications
Leadership	Ability to perform efficiently in an interdisciplinary team as a leader.	Group projects for leadership roles; Peer evaluation on the leadership skills; Faculty evaluations; Leadership activities and workshops
Professionalism/ Work Ethic	Ability to identify problems and develop economically feasible solutions through critical thinking, scientific knowledge, etc.	Faculty evaluation; Self-assessment; Mentor evaluations; Career development activities; Graduate surveys.
Career Management	Demonstrate the ability to effectively communicate experimental results orally with a range of audiences and exhibit efficient writing skills	Career assessments; Career development activities; Alumni surveys; Internships and co-op experiences; Mentor evaluation.
Global/Intercultural Fluency	Ability to identify problems and develop economically feasible solutions through critical thinking, scientific knowledge, engineering tools, and systematic approaches related to advanced mechanical engineering field	Self-assessment; Faculty evaluations; Study abroad experiences; Cross-cultural projects via international collaboration; Cultural Diversity and inclusion training

[1] Direct measures may include assessments, HIPsREsill, exams, etc.

39. How will learning outcomes for the program be assessed?^ Attach the curriculum map for the upper division or major curriculum.

The assessment of the program will be conducted by the School of Environmental, Civil, Agricultural and Mechanical Engineering (ECAM) graduate faculty working in conjunction with the College of Engineering Associate Dean for Academic Affairs. The results of the annual assessment will be reported to the UGA Office of Accreditation and Institutional Effectiveness, as well as to the ECAM graduate faculty and the ECAM External Advisory Board for their use in program development.

The student learning outcomes and the specific, measurable performance indicators are listed below:

a. **Systems thinking competency**

   The student is able to recognize and understands relationship:

   1. to analyze complex systems
   2. to think of how systems are embedded within different domains and scales
   3. to deal with uncertainty.

b. **Anticipatory competency**

   The student is able to understand and evaluate multiple futures possible/probable/desirable:

   1. to apply the precautionary principle
   2. to assess the consequences of actions
   3. to deal with risks and changes

c. **Collaboration competency**

   The student is able to learn from others:

   1. to understand and respect the needs, perspectives and actions of others
   2. to understand, relate to and be sensitive to others
   3. to deal with conflicts in a group
   4. to facilitate collaborative and participatory problem solving

d. **Integrated problem-solving competency**

   The student presents the overarching ability to apply different problem-solving frameworks to complex resilience problems and develop viable, inclusive and equitable solution options that promote sustainable development, integrating the abovementioned competences.

Direct assessment of the student learning outcomes will be performed by the Graduate Advisory Committee members during each student dissertation defense. An assessment rubric has been developed by the College of Engineering and is currently used for assessment of students in the Ph.D. Engineering program. Indirect assessment of student learning outcomes will be undertaken with a student exit survey.

40. How will outcomes for graduates of the program be assessed?
(Outcomes may include employment and placement rates, student or employer surveys, or other assessments of graduate outcomes)

Alumni Survey: The Civil and Environmental Engineering (Ph.D.) alumni will be asked to complete a Qualtrics survey every 3 years which assesses employment and placement rates as well as the value of their education in their current position. This survey will also aid in determining specific courses and research areas in the Civil and Environmental Ph.D. program that are considered the most relevant to the industry and if new areas need to be incorporated into the program of study. The Graduate Director will collect the survey responses and the School Chair will tabulate the results and report them to the faculty at the annual faculty meeting. This is an indirect assessment of all Learning Outcomes.

Advisory Board Focus Group: The Civil and Environmental Engineering (Ph.D.) program has identified two primary constituencies: the *civil and environmental engineering industry* and *civil and environmental engineering alumni*. The School of Environmental, Civil, Agricultural and Mechanical Engineering advisory board is comprised of representatives from both of these constituent groups. Each member of the board serves a three-year term; at the completion of the term each member can opt to step down from the board or commence another three-year term. Focus groups are performed during the annual advisory board meeting every three years to ensure graduate outcomes are consistent with industry needs and that the targeted outcomes are being attained. The results of the focus groups are reviewed by the School Chair to determine alignment with industry needs and satisfactory attainment. If an obvious disparity exists between the constituencies' needs, a special faculty meeting is scheduled. Program faculty review feedback from the focus groups and draft an appropriate response based on constituent needs. This will be sent to the advisory board who will determine if the response is acceptable or if further revisions are needed.

41. List the entire course of study required to complete the academic program.^
Include course: prefixes, numbers, titles, and credit hour requirements
Indicate the word "new" beside new courses
Include a program of study

Minimum requirement – 72 credit hours (minimum of 28 credit hours coursework; minimum of 44 credit hours research and dissertation)

A thesis master's degree from an accredited university may be accepted for up to 12 credit hours, in which case a minimum of 60 credit hours of approved coursework, research, and dissertation beyond the M.S. degree would be required.

Required Advanced Engineering Core Courses (7 credit hours):

- ENGR 8130 Statistical Learning and Data Mining in Engineering (3 credit hours)
- ENGR 8910, Foundations for Engineering Research (3 credit hours)
- ENGR 8950, Graduate Seminar (1 semester, 1 credit hours) *

Electives (21 credit hours):
Students must complete a minimum of 9 credit hours selected from the list of approved electives and an additional 12 credit hours of any courses. For electives, at least 3 credit hours must be 8000-level or above. Students will work with their graduate advisor to select the most appropriate coursework to ensure breadth of understanding as well as mastery of knowledge in a specific subject area. Students may work with their graduate advisor to develop an interdisciplinary plan of coursework drawing from the extensive graduate course offerings available outside the College of Engineering at UGA.

The University requires that students who are accepted to the Ph.D. program directly from a B.S. degree or who switch to a Ph.D. program before earning an M.S. degree must complete an additional 4 semester hours of University of Georgia courses open only to graduate students. Students entering Civil and Environmental Engineering (Ph.D.) without a master's degree must have completed an undergraduate engineering degree.

Approved Electives:

- BCHE(ENVE) 6490, Environmental Engineering Remediation Design (3 credit hours)
- CVLE 6330, Advanced Structural Analysis (3 credit hours)
- CVLE 6340, Design of Bridges (3 credit hours)
- CVLE 6470, Pavement Design (3 credit hours)
- CVLE 8110, Environmental River Mechanics (3 credit hours)
- CVLE 8140, Transport and Mixing in Natural Flows (3 credit hours)
- CVLE 8410, Inelastic Behavior of Construction Materials (3 credit hours)

- CVLE 8420, Geomechanics (3 credit hours)
- CVLE 8460, Soil Improvement (3 credit hours)
- CVLE 8470, Advanced Pavement System Design (3 credit hours)
- CVLE 8510, Advanced Concrete Materials (3 credit hours)
- CVLE 8550, Design of Prestressed Concrete Structures (3 credit hours)
- CVLE(MCHE) 8160, Advanced Fluid Mechanics (3 credit hours)
- CVLE(MCHE) 8350, Nonlinear Finite Element Analysis (3 credit hours)
- ENGR 6350, Introduction to Finite Element Analysis (3 credit hours)
- ENGR 6490, Renewable Energy Engineering (3 credit hours)
- ENGR 8103, Computational Engineering: Fundamentals, Elliptic, and Parabolic Differential Equations (3 credit hours)
- ENGR 8990, Advanced Topics in Engineering (3 credit hours)
- ENGR(INFO) 8110, Informatics in Engineering and Environmental Sciences (3 credit hours)
- ENVE 6230, Energy in Nature, Civilization, and Engineering (3 credit hours)
- ENVE 6250, Energy Systems and the Environment (3 credit hours)
- ENVE 6410, Open Channel Hydraulics
- ENVE 6440, Computer Modeling in Water Resources (3 credit hours)
- ENVE 6450, Engineering Hydrology and Hydraulics (3 credit hours)
- ENVE 6460, Groundwater Hydrology for Engineers (3 credit hours)
- ENVE 6470, Environmental Engineering Unit Operations (3 credit hours)
- ENVE 6530, Energy and Environmental Policy Analysis (3 credit hours)
- ENVE 8450, Design for Rapid Change: Food, Energy, Water, and Climate (3 credit hours)
- MCHE 6400, Air Pollution Engineering
- MCHE 8380, Continuum Mechanics (3 credit hours)
- MCHE 8650, Aerosol Science and Engineering
- MCHE(CHEM) 8970, Combustion Science (3 credit hours)

Research and Dissertation (44 credit hours):

- A minimum of 41 hours of ENGR 9000, Doctoral Research, or ENGR 9010, Project-Focused Doctoral Research. Typically, students complete more than 42 credit hours with the approval of the Graduate Advisory Committee.
- 3 hours of ENGR 9300, Doctoral Dissertation, are required on the Plan of Study.

** Only 3 hours of Graduate Seminar may apply on the Program of Study and be included in the 72-credit hour requirement. Students are strongly encouraged to continue regular attendance at speaker series presentations even if not formally registered in the seminar.*

Sample program of study for a Ph.D degree in Civil and Environmental Engineering

YEAR ONE					
Fall Semester		**Hours**	**Spring Semester**		**Hours**
GRSC 7001	GradFIRST Seminar	1	ENGR 8950	ECAM Graduate Seminar	1
CVLE/MCHE 8640	Advanced Strength of Materials	3	CVLE 8410	Inelastic Behavior of Construction Materials	3
ENGR 8910	Foundations for Engineering Research	3	ENGR 8103	Computational Engineering: Fundamentals, Elliptic, and Parabolic Differential Equations	3
ENGR 9000	Doctoral Research	2	ENGR 9000	Doctoral Research	2
Total Credit Hours		**9**	**Total Credit Hours**		**9**
Summer					
ENGR 9000	Doctoral Research	9			
Total Credit Hours		**9**			

YEAR TWO					
Fall Semester		**Hours**	**Spring Semester**		**Hours**
CVLE(MCHE) 8160	Advanced Fluid Mechanics	3	ENGR 8130	Statistical Learning and Data Mining in Engineering	3
	Elective	3		Elective	3
ENGR 8950	ECAM Graduate Seminar	1	ENGR 8950	ECAM Graduate Seminar	1
ENGR 9000	Doctoral Research	2	ENGR 9000	Doctoral Research	2
Total Credit Hours		**9**	**Total Credit Hours**		**9**
Summer					
ENGR 9000	Doctoral Research	9			
Total Credit Hours		**9**			

YEAR THREE					
Fall Semester		**Hours**	**Spring Semester**		**Hours**
	Elective	3	ENGR 9000	Doctoral Research	6
ENGR 9000	Doctoral Research	6	ENGR 9300	Doctoral Dissertation	3
Total Credit Hours		**9**	**Total Credit Hours**		**9**

D. IMPLEMENTATION

42. Provide an enrollment projection for the next four academic years^

	Year 1	Year 2	Year 3	Year 4
Fiscal Year (Fall to Summer)	2023-24	2024-25	2025-26	2026-27
Base enrollment[1]	0	10	20	33
Lost to Attrition (should be negative)	0	-1	-1	-1
New to the institution	7	8	10	10
Shifted from Other programs within your institution	3	3	4	5
Total Enrollment	10	20	33	47
Graduates	0	0	0	8
Carry forward base enrollment for next year	10	20	33	39

[1]Total enrollment for year 1 becomes the base enrollment for year 2

a. Discuss the assumptions informing your enrollment estimates (i.e. for example, you may highlight anticipated recruiting targets and markets, if and how program implementation will shift enrollment from other programs at the institution, etc.)

Graduate faculty in the School of Environmental, Civil, Agricultural, and Mechanical Engineering currently advise students enrolled in the Engineering (Ph.D.) program with areas of emphasis in Environment and Water, Resilient Infrastructure Systems, and Thermal and Fluid Systems. In fall 2022, 10 students were enrolled in the Engineering Ph.D. with these areas of emphasis; some of these students will choose to switch to the new Civil and Environmental Engineering program. These are reflected in the number of shifted students as well as those who will move from the Area of Emphasis in Civil and Environmental Engineering.

For planning purposes, the college is assuming 3 to 5 students per year will transfer the new program and that the first students will graduate at the beginning of year 4 from the new program. This is a conservative assumption. Historical data indicate for the previous three years the college consistently recruited 7-8 new students to the Engineering Ph.D. with the above areas of emphasis each academic year and graduate 20-25% of current students. The school fully expects to sustain a program enrollment of at least 10 students for the new Ph.D. program in Civil and Environmental Engineering. Further it is expected that enrollment will increase in future years as the five faculty members hired in 2022 through the Presidential Cluster Hiring Initiative will hire Ph.D. students for their research activities.

b. If projections are significantly different than enrollment growth for the institution overall, please explain.

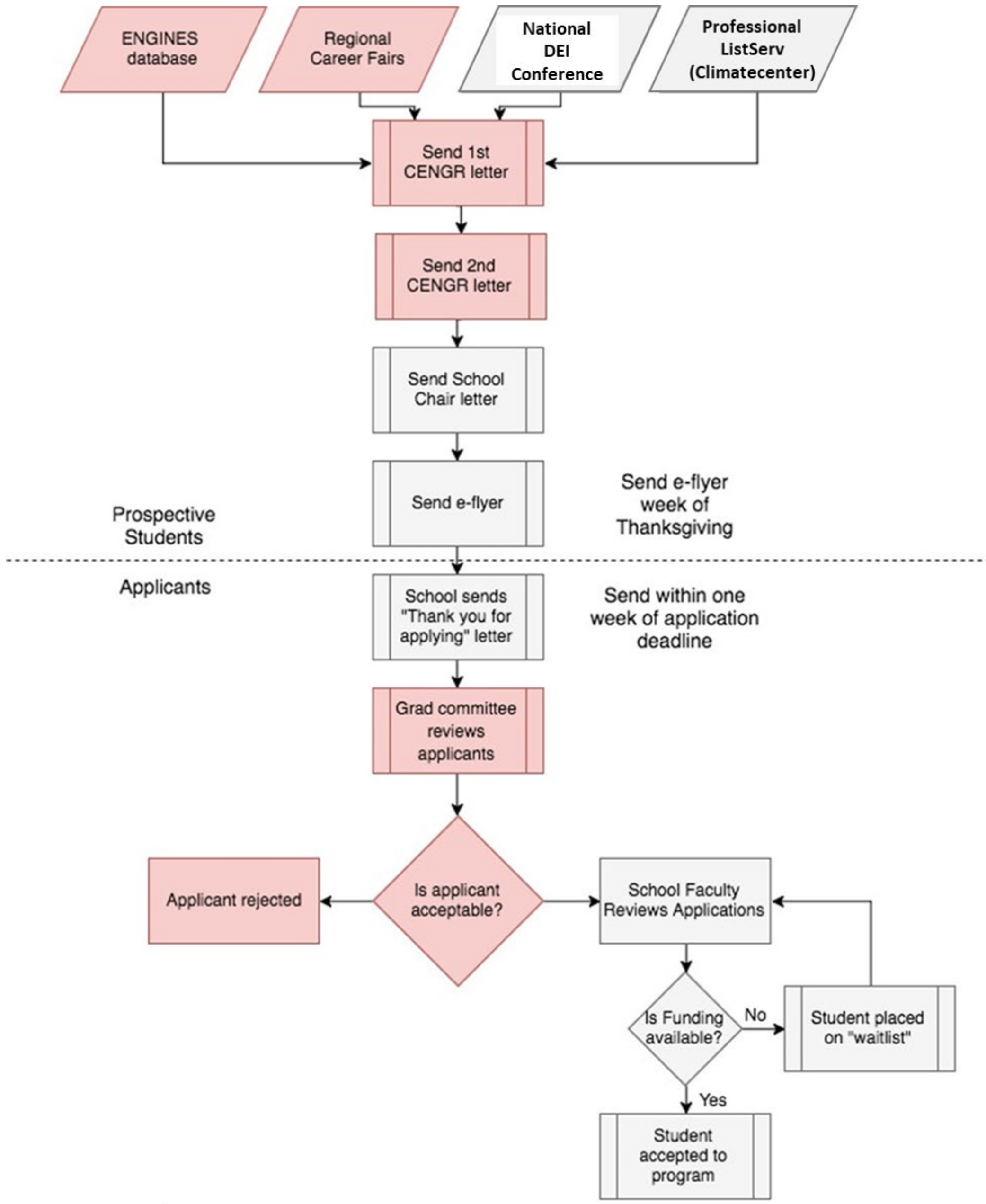
Not applicable

43. If projected program enrollment is not realized in year two, what actions are you prepared to take?

In the event that program enrollment is not realized, the school will increase recruitment activities by increasing social media presence, advertising in relevant print and online publications, such as College of Engineering, *AEESP*, ASCE, website, and by proactively encouraging current undergraduate and master's students to pursue this Ph.D. program.

44. Discuss the marketing and recruitment plan for the program. Include how the program will be marketed to adult learners and underrepresented and special populations of students. What resources have been budgeted for marketing the new program?

The school will utilize a number of avenues to market the new program and recruit students, including the ENGINES database of prospective engineering graduate students, regional career fairs, professional meetings including the American Society of Civil Engineers (ASCE), American Concrete Institute (ACI), Transportation Research Board (TRB) of National Academies, Institute of Transportation Engineers (ITE), the Association of Environmental Engineering and Science Professors (AEESP), the American Water Works Association (AWWA), and a variety of professional listservs, such as Climatecenter. The program will be prominently displayed on the school's website. The flow chart for student recruitment is presented below.



45. Provide a brief marketing description for the program that can be used on the Georgia OnMyLine website.

The Ph.D. in Civil and Environmental Engineering provides maximum flexibility for students to address 21st century challenges on sustainability development through their studies and research. Within the civil and environmental engineering degree, students tackle research problems that address the need for products and systems to provide robust infrastructure services, technologies to ensure clean and sustainable energy supply, novel materials to secure safe and abundant water supplies, tools to evaluate life cycle impacts, and computational models to understand interaction between infrastructural and natural system interaction.

46. If this proposal is for a Doctorate program, provide information below for at least three external and one USG reviewer of aspirational or comparative peer programs.

Note: External reviewers must hold the rank of associate professor or higher in addition to other administrative titles.

Dr. Hanadi S. Rifai

Moores Professor and Associate Dean for Research and Facilities

University of Houston

rifai@uh.edu

713-743-4271

Dr. Zachary Grasley

Professor and Department Head, Civil and Environmental Engineering

Texas A&M University

zgrasley@tamu.edu

979-845-2438

Dr. Joseph F. Labuz

Professor and Former Head, Department of Civil, Environmental, and Geo-Engineering

University of Minnesota-Twin Cities

jlabuz@umn.edu

612-625-9060

Dr. Donald R. Webster

Karen and John Huff Chair of the School of Civil and Environmental Engineering

Georgia Institute of Technology

dwebster@ce.gatech.edu

404-894-2201

F. RESOURCES

F1. Finance^: Complete and submit the Excel budget forms and the questions below.
(Do not cut and paste in the excel budget template into this document, submit the Excel budget templates separately.)

47. Are you requesting a differential tuition rate for this program? (masters, doctoral, and professional programs only)

☒ No (Move to answer question 48)

☐ Yes (If yes, answer questions 47a & 47b)

a. ***What is the differential rate being requested? The rate below should reflect the core tuition <u>plus</u> the differential, i.e. the tuition rate being advertised to the student.***

In-State per Semester: $Enter Amount

Out-of-State per Semester: $Enter Amount

b. ***Provide tuition and mandatory fee rates assessed by competitive/peer programs per full-time student per semester. Please complete the table below:***

Institution name	Link to institution's tuition & fee website	In-state tuition	Out-of-state tuition	In-state fees	Out-of-state fees

48. If existing funds are being reallocated, describe the impact on existing programs and the plan to mitigate these impacts.

Neither faculty nor staff hiring or reassignments are necessary. The school will not need to create new sections of any existing courses to meet additional demand as the courses are already being offered under Engineering (Ph.D.).

49. If student fees are being charged (excluding mandatory fees), explain the cost and benefit to students, per fee.

Not applicable.

50. Are there any additional financial costs that students will have to take on as part of this program, but not assessed directly by the institution? (e.g. software licenses, equipment, travel, etc.) If so, please describe these costs and what strategies you have considered to decrease the student's financial burden?

No additional costs to students are anticipated.

51. How does the institution plan for and fund increased indirect costs associated with the growth in students anticipated in the proposed program? Consider costs such as student advisement, student support services, tutoring, career services, additional library materials, technology, or other infrastructure.

All resources needed for the program are pre-existing. The school will utilize the current resources such as personnel, library, equipment, laboratory, and computing available at the school, college, and university levels. In addition, the school will obtain funds from the university for new hires as part of the Presidential Interdisciplinary Hiring Initiative.

F2. Faculty^ – Explain your faculty and staff plan for the program

52. Discuss how existing courses may be incorporated into this new program:

a. Course Development

# of total courses in the curriculum:	**33**
# of existing courses to be part of the new program	**33**
Net number of new courses to be developed	**0**

b. Comment on the costs and workload related to the new course development.

No new courses are being proposed or developed as part of the program and therefore, no new resources are needed to cover instructional costs.

53. Explain how <u>current faculty and staff</u> will contribute to the program.^

a. How many faculty will be re-directed to this program from existing programs?

0

b. If this program is approved, what will be the new teaching load and distribution of time for the current faculty members? How will existing staff be impacted?

The School of Environmental, Civil, Agricultural, and Mechanical Engineering has 20 faculty currently teaching courses that are directly related to the proposed program of study or who are performing civil and environmental engineering research. These faculty will be the major professors for students enrolled in the proposed Ph.D. program. The teaching loads for existing faculty will remain the same. The courses, currently offered as part of the existing areas of emphasis in Environment and Water, Resilient Infrastructure Systems, Energy Systems, and Fluid and Thermal Systems under the Engineering (Ph.D.) major, will now be offered as part of the new major. Existing staff will not be impacted by the creation of the new major.

c. List the faculty that will be redirected from their current teaching load assignments to support this new program.

No faculty will be redirected from their current teaching assignments. The proposed degree will incorporate courses that are currently taught by existing, qualified faculty as part of the areas of emphasis in Environment and Water, Resilient Infrastructure Systems, Energy Systems, and Fluid and Thermal Systems.

d. Explain who will be teaching the existing courses that are being released so faculty can teach a new program course. Additionally, please discuss the fiscal implications associated with course releases and redirections of faculty.

Not applicable.

e. What costs are included in your budget for course development? (Consider professional development, course development time buy out, overload pay, and re-training)

Not applicable.

f. Attach your SACSCOC roster for the proposed program. Include in parentheses the individual with administrative responsibility for the program and whether listed positions are projected new hires and/or currently vacant.

Faculty Name	**Rank**	**Courses Taught**	**Academic Degrees**	**Current Workload** *% EFT Research, Instruction, Service*	**Other Qualifications and Comments** *Research Areas*
Bjorn Birgisson	P	CVLE 6470, 3 (G)	Ph.D. University of Minnesota -Twin Cities, 1996	60(R)/40 (I)	• Materials modeling • Geomechanics • Pavement engineering
Chorzepa, Mi Geum	ASC	CVLE(MCHE) 8350, 3 (G)	Ph.D. Structural Engineering, 2008	50(R)50 (I)	• Structural analysis & design • Nonlinear finite element analysis • Nuclear safety-related structures • Containment structures • Steel plate structures • Cryogenic structures • Sustainable building design • Progressive collapse analysis • Materials modeling • Forensic engineering • Structural repair • Composite materials • Earthquake engineering
Durham, Stephan	P	CVLE 8510, 3 CVLE 8550, 3 (G)	Ph.D. Civil Engineering, 2005	38 I 52(I) 10(A)	• Structural materials • Concrete materials properties • Structural evaluation • Sustainability through concrete materials and construction • Pervious concrete pavements • Bridge engineering
Bilskie, Matthew	AST	ENVE 6450, 3 (G)	Ph.D. Engineering	50 (R) 50(I)	• Climate change and sea level rise • Coastal resiliency • Coastal engineering • Natural and nature-based infrastructure • Compound flooding • Hurricane storm surge • Stakeholder engagement
Bledsoe, Brian	P	ENVE 6435, 3 (G)	Ph.D. Engineering, 1999	50 I 33(I) 17(S)	• Hydrology, hydraulics, and fluvial geomorphology • Ecological engineering and ecosystem restoration • Urban streams, stormwater, and floodplain networks

					• Water-centered planning for sustainability and resilience • Watershed management • Water quality/quantity interface
Jambeck, Jenna	P	ENVE 6435, 3 (G)	Ph.D. Environmental Engineering Sciences, 2004	50 (R) 50(I)	• Environmental engineering • Solid and hazardous waste • Marine debris
Kim, S. Sonny	P	CVLE 6470, 3 (G)	Ph.D. Civil Engineering, 2004	50 (R) 50(I)	• Use of nondestructive testing, remote sensing, and machine learning for resilient/sustainable infrastructure health monitoring • Climate resilient infrastructure • Saltmarsh restoration • Transportation geotechnics • Mechanistic-empirical pavement design
Lawrence, Thomas	PP	Fall: CVLE(MCHE)(LAND) 6660, 3 (G)	Ph.D. Mechanical Engineering, 2004	22 (R) 60 (I) 18 (S)	• Green buildings • Smart grid and building energy management • HVAC systems • Energy informatics
Li, Ke "Luke"	ASC	ENVE 6470, 3 (G) ENVE 6550, 3 (G)	Ph.D. Environmental Engineering, 2003	75 (R) 25(I)	• Environmental system modeling • Water/wastewater treatment • Urban sustainability • Life cycle assessment • Water distribution network simulation • Emerging contaminants control
David Gattie	ASC				• Energy systems and environmental issues • Power generation • Energy policy
Caner Kazanci	ASC	**Fall:** ENGR 8103, 3 (G)	Ph.D., Mathematical Sciences, Carnegie Mellon University, 2005	50% R 50% I	• Biological and ecological modeling, simulation, and analysis. • Numerical analysis, dynamical systems. • Ecological network analysis (ENA), ecological thermodynamics. • Stochastic modeling tools, individual based modeling. • Collective behavior of large biochemical reaction networks, the relation between network structure and system dynamics.
William Kisaalita	P	**Fall:**	Ph.D., Chemical	50% R 50% I	• Tissue engineering • Cell-surface interactions

		ENGR 8910, 3 (G)	Engineering, University of British Columbia, Canada, 1987		• Assays for high throughput screening (HTS) • Renewable energy utilization with emphasis on biogas-powered cooling • Global service learning
Whitney Lisenbee	AST	ENVE 6435, 3	Ph.D., University of Tennessee-Knoxville	50% R 50% I	• Hydrologic modeling • Urban stormwater • Agricultural water quality • Interactions between agriculture and urban systems
Brandon Rotavera	ASC	Fall: MCHE(CHEM) 8970, 3 (G)	Ph.D., Texas A&M University	60(R) 40(I)	• Biofuels • Sustainable energy • Combustion • Thermodynamics • Lasers/optics • Physical chemistry • Chemical kinetics • Fluid dynamics • Spectroscopy • Gas chromatography • Mass spectrometry
Schramski, John	ASC	ENVE 8650, 3 (G)	Ph.D. Ecology, 2006	50 (R) 50(I)	• Energy systems • Ecosystem energetics • Thermodynamics • Theoretical ecology • Complex network analysis • Ecological network theory • Energy supply and demand • Environmental energy systems • Sustainable use of global ecosystems • Food security • Natural resources engineering
David Stooksbury	ASC	Fall: ENGR 8110, , 3 (G)			• Climate • Coastal systems • Wind and solar energy resource assessment • Statistical modeling of systems impacted by weather and climate
Woodson, Clifton Brock	ASC	**Spring:** CVLE(MCHE) 8160, 3 (G)	Ph.D., Civil Engineering, Georgia Institute of Technology, 2005	50 (R) 50 (I)	• Environmental Fluid mechanics • Mixing and transport processes • Coastal oceanography • Biophysical interactions in the ocean • Fisheries • Climate change • Sustainable use of marine ecosystems

Yang, Jidong	ASC	CVLE 6210, 3 (G) CVLE 6220, 3 (G) ENGR 8990, 3 (G) ENGR 8990, 3 (G)	Ph.D. University of South Florida, 2004	50 (R) 50(I)	• Transportation engineering and planning • Sustainable and resilient infrastructure systems • Smart mobility systems • Statistical and econometric models • Data mining and machine learning methods • Computer vision and artificial intelligence applications
Christina H. Fuller	ASC	MCHE 6400, 3	Ph.D, Havard University, 2011	50% R 50% I	• Environmental health and justice • Air pollution • Community-engaged research • Green infrastructure
Alysha Helmrich	AST	ENVE 6230, 3	Ph.D, Arizona State University, 2021	50% R 50% I	• Urban resilience and navigating periods of stability and instability

54. Explain your plan for <u>new</u> faculty and staff for the program:

a. How many new faculty will be needed for this program over the next four years? Enter #0

b. Explanation:

No additional faculty are required to offer this major, as the courses are already being offered as areas of emphasis under Engineering (Ph.D.). Nonetheless, the college will hire at least 14 new tenure-track faculty members over the next year as part of the Presidential Interdisciplinary Hiring Initiative, especially in the field of Resilient Infrastructure for Sustainability and Equity.

55. How many new staff will be needed for this program over the next four years?

a. Discuss why new or additional staff resources are needed. Consider staff needs, support services (i.e. advisement, faculty support, etc.)

No new staff or staff resources will be required for the proposed major.

F3. Facilities – complete the questions below:

56. Where will the program be offered?^ Mark all that apply

☒ Main campus

☐ Satellite campus: Specify Here

☐ Other: Specify Here

☐ 100% Online

57. Will new or renovated facilities or space be needed for this program over the next four years?

☒ No

☐ Yes (*If yes, complete the table below, inserting additional rows as needed).*

Capital Costs for Needed Facilities and Space

Facility/Space Name	Gross Square Footage	Start Up Costs	Ongoing Costs	Est. Occupancy Date	Funding Source
New Construction					
Renovations and Infrastructure*					
Purchases: Land, Buildings etc.					
Lease space					
TOTAL Cost		**$0**	**$0**		

*Include the name of the building or location being impacted and what will need to be done. Infrastructure includes new systems such as: water, electrical, IT networks, HVAC etc.

58. Discuss the impact of construction or renovation on existing campus activities and how disruptions will be mitigated. Explain how existing programs benefit from new facilities and/or space(s) and changes to existing space.

Not applicable

59. Will any existing programs be negatively impacted (e.g. lose classroom or office space) by proposed facility changes? If so, discuss how the impacts of these changes will be mitigated.^

No

60. Are any of these new facilities or major renovations listed in the table above (Question 57) NOT included in the institution-level facilities master plan?

Not applicable

61. Will any of the following types of space be required: instructional, fine arts, meeting, study, or dedicated office?

☒ No (Move to Question 63).

☐ Yes (*If yes, complete question 62. Insert additional rows as needed*).

62. Complete the table below. Specify if these spaces are existing or new in the table below.^ If new, provide the semester and year of completion.

Space	New Space (ASF)	Use Existing Space (as is) (ASF)	Use Existing Space (Renovated) (ASF)	Semester/ Year of Occupancy
Dry Labs (STEM related)		12,000		Fall/2014; Fall/2018; Spring/2022; Fall/2022
Wet Labs (STEM related)		4,000		Fall/2018/Spring/ 2022; Fall/2022
Dedicated Offices		6,000		Fall/2018; Spring/2022; Fall/2022
Fine Arts Spaces1				
Classrooms		4,000		Fall/2018; Fall/2022; Spring/2022
Meeting Rooms		300		Fall/2022
Student Study Space		500		Fall/2018; Spring/2022; Fall/2022
Other (Specify)				

[1]Fine arts spaces can include theatres, recital halls, visual arts studios, performing arts centers, recording studios, design labs, and other performance venues.

63. Are there facility needs related to accreditation?^ Are there any accreditation standards or guidelines that will impact facilities/space needs now or in the future? If so, please describe the projected impact.

Not applicable.

F4. Technology

64. Identify any major equipment or technology integral to program start-up and operations. List any equipment or assets over $5,000 (cumulative per asset) needed to start-up and run the program (insert rows as needed).

	Technology and Equipment	Start-up Costs	On-going Costs	Est. Start Date of Operations/Use
1				
2				
3				
4				
5				
6				
Total Technology Costs		**0**	**0**	

RISKS AND ASSUMPTIONS

65. In the table below, list any risks to the program's implementation over the next four years. For each risk, identify the severity (low, medium, high), probability of occurrence (low, medium, high), and the institution's mitigation strategy for each risk. Insert additional rows as needed. (e.g. Are faculty available for the cost and time frame).

Risk	Severity	Probability	Risk Mitigation Strategy

This major is currently offered as a concentration with robust enrollment. Therefore, there is no assumed risk in implementing it as a major.

66. List any assumptions being made for this program to launch and be successful (e.g. SACSCOC accreditation request is approved, etc.).

The school has successfully developed Ph.D. engineering program with areas of emphasis in Environment and Water, Resilient Infrastructure Systems, Energy Systems, and Fluid and Thermal Systems. Student enrollment in the current program is strong and continues increasing. This successful experience together with current resources would ensure the success of the proposed Ph.D. program in Civil and Environmental Engineering.

G. INSTITUTION APPROVAL

Have you completed and submitted the signature page?

APPENDIX I

Use this section to include letters of support, curriculum course descriptions, and recent rulings by accrediting bodies attesting to degree level changes for specific disciplines, and other information.

Course Descriptions

Course Prefix/Number	Credit Hours	Course Title	Course Description	Required /Elective
CVLE 6330	3	Advanced Structural Analysis	Provides students with an in-depth understanding of matrix and computer-oriented analysis methods for civil engineering structures. Matrix methods are at the core of structural analysis software extensively used in the industry. Explores matrix formulation of flexibility and stiffness methods. Three-dimensional truss, beam, and frame members will be studied using a commercially available structural analysis program.	S
CVLE 6340	3	Design of Bridges	Types of bridges, superstructure and substructure components, design considerations, loads, reinforced concrete and steel bridges, seismic design	S
CVLE 6470	3	Pavement Design	A study of the methods used to determine thickness and composition of the components of both flexible and rigid highway pavements. Classwork will also include paving materials, Mechanistic-Empirical (ME) pavement design concept, traffic stress and strain, and pavement management system. Standard techniques and computer software will be utilized in this class.	S
CVLE 8110	3	Environmental River Mechanics	River hydraulics, sediment transport, fluvial geomorphology, and river response to human influences, with emphasis on restoration design and environmental aspects.	S
CVLE 8420	3	Geomechanics	An introduction to the theory and application of fundamental mechanics, such as elasticity, plasticity, and viscoelasticity, to soil mechanics problems.	S
CVLE 8510	3	Advanced Concrete Materials	Provides an advanced understanding of the design and production of concrete mixtures for strength and durability as well as testing methods for strength, permeability, freeze-thaw, sulfate attack, and non-destructive methods of evaluation of concrete structures. Additional topics will include critical properties of concrete and trouble shooting and prevention.	S
CVLE 8550	3	Prestressed Concrete Design	Provides the engineering student with the knowledge required to design and construct prestressed concrete structures. Emphasis will be placed on the behavior of prestressed concrete under load along with potential failure mechanisms.	S
CVLE(MCHE) 8160	3	Advanced Fluid Mechanics	A mathematical treatment of fluid mechanics using tensors with emphasis on viscosity, momentum balance in laminar flow, equations of	E

			change, velocity distribution in laminar and turbulent flow, interphase transport, macroscopic balance, and polymeric liquids. Analytical and numeric methods for solving fluid mechanic problems will be used.	
CVLE(MCHE) 8640	3	Advanced Strength of Materials	Provides students with the essential knowledge necessary to analyze structural/mechanical systems and components as well as the ability to interpret analysis results. Basic concepts and tools for analyzing engineering problems (elasticity equations, equilibrium, compatibility, etc.) will be emphasized as well as the mathematical formulations.	S
CVLE(MCHE) 8350	3	Nonlinear Finite Element Analysis	The formulations and numerical solution of nonlinear problems in structural, mechanical, and biological/biomedical engineering by finite element methods. Both geometric and material nonlinearities will be studied. Students are expected to learn how to use a finite element analysis tool and complete a practical engineering project.	S
ENGR 6350	3	Finite Element Analysis (F)	Fundamental finite element theory for the solution of engineering problems. Geometrical modelling techniques, element selection, and tests for accuracy. Emphasis on problems in structural mechanics and elasticity.	S
ENGR 6470	3	Environmental Engineering Unit Operations	Engineering science and design related to treatment of drinking water and wastewater as well as the treatment and ultimate disposal of the sludges created during water treatment.	S
ENGR 6490	3	Renewable Energy Engineering	Basic principles and technical details of various renewable energy technologies (solar, biomass, wind, hydroelectric, geothermal, tidal, and wave energy) for the sustainable future. Process design, energy analysis, engineering economics, and environmental assessment of renewable energy systems.	S
ENGR 6650	3	HVAC Systems for Buildings and Industry	A study of the system concepts, sizing, design, and equipment used for the heating, ventilation, and air conditioning systems in buildings (commercial and residential) as well as industrial applications.	S
ENGR 8103	3	Computational Engineering: Fundamentals, Elliptic, and Parabolic Differential Equations	The use of computational mathematics to develop models, evaluate data, and make predictions of relevance to engineering. Numerical differentiation and integration, numerical solutions of algebraic, ordinary, elliptic and parabolic differential equations, error analysis, and programming techniques are examined in the context of engineering applications.	S
ENGR 8130	3	Statistical Learning and Data Mining in Engineering	Explores statistical learning methods and techniques with an emphasis on their applications in engineering. The focus will be on the classic and modern statistical and machine-learning methods, including linear and logistic	R

			regression, discriminant analysis, k-nearest neighbors, tree-based methods, support vector machines, principal components analysis, manifold learning, and clustering methods.	
ENGR 8180	3	Advanced Mass Transfer	Basic laws of mass transport will be derived. Advanced mass transport will focus on molar flux, Fick's law, binary diffusion, two phase transfer, convective mass transfer, mass transfer coefficients, and mass transfer with chemical reaction. A project will be assigned requiring numerical solution of governing mass transport equations.	S
ENGR 8910	3	Foundations for Engineering Research	The philosophy of engineering research, research and design methodologies, review of the departmental research programs and related training goals, and writing and presenting thesis and dissertation proposals and grant proposals.	R
ENGR 8950	1x3	Graduate Seminar	Presentations/discussions related to engineering research, teaching, design, and service presented by students, faculty, and industry leaders.	R
ENGR 8990	3	Advanced Topics in Engineering	Introduces modern deep learning methods and architectures (e.g., convolutional neural networks (CNNs) and recurrent neural networks (RNNs), energy-based models) with an emphasis on their engineering applications. The focuses of the course will be on major advancements in deep learning in recent years. The core ideas and principles of deep learning will be discussed. Both supervised and self-supervised learning will be covered with an emphasis on vision applications, including image classification, object detection, and image segmentation.	S
ENGR 9000	3	Doctoral Research	Research while enrolled for a doctoral degree under the direction of faculty members.	R
ENGR 9010	3	Project-Focused Doctoral Research	Project-focused research while enrolled for the Ph.D. degree under the direction of faculty members. This course is for students who are performing sponsored research specifically devoted toward completing project deliverables important to project sponsors that may not be directly related to Ph.D. dissertation research.	R
ENGR 9300	Variable	Doctoral Dissertation	Dissertation writing under the direction of the major professor	R
ENGR(INFO) 8110	3	Informatics in Engineering and Environmental Sciences	The philosophical and theoretical basis of informatics, with applications in civil engineering, environmental engineering, and the environmental sciences. Readily available software will be used throughout the course. Specific applications will depend on the needs of the students in the course.	S
ENVE 6250	3	Energy Systems and the Environment	A study of fundamental energy and power systems in modern industrialized countries and the local, national, and global environmental issues associated with these systems. Attention will be given to the economic implications of	S

			energy use and the prospects for renewable energy in the future.	
ENVE 6440	3	Computer Modeling in Water Resources	Applications of mathematical models to hydrologic and hydraulic systems in the natural and built environment. Students will develop and utilize mathematical models to solve typical water resource problems and will complete an individual project that includes designing, analyzing, and optimizing an engineered water resource facility or system.	S
ENVE 6460	3	Groundwater Hydrology for Engineers	Occurrence and movement of ground water, derivation of equations of saturated and unsaturated flow, aquifer hydraulic parameter estimation, analytical solutions to flow problems. Solute transport equations and development of analytical solutions. Use of numerical tool for solving flow and transport problems.	S
ENVE 6550	3	Environmental Life Cycle Analysis	An in-depth look at life cycle analysis (LCA), the existing models and analytical methodologies, and their applications. Conducting Life Cycle Analyses for small scale items such as individual manufactured products up through larger scaled engineered system items such as an engineered structure, transportation system, etc.	S
ENVE 6230	3	Energy in Nature, Civilization, and Engineering	A rigorous quantitative study, project, design, and facilitated discussion of global energy magnitudes and their transformations initiated as radiation from the sun, manifesting into different renewable forms throughout the biosphere, and concluding as stored fossilized solar energy, all in the engineering context of a mechanical preindustrial and then industrial civilization.	S
ENVE 6530	3	Energy and Environmental Policy Analysis	A study of how public policy is shaped by the energy and environmental issues of society since the mid-1900's. Topics will include the advent of stronger environmental protection regulations in the later 1960's and 1970's due to increased public awareness and the ever-evolving energy policy starting with the initial energy shortages in the 1970's and continuing on to the current energy policies which include energy supply, energy demand, and environmental concerns.	S
ENVE 6450	3	Engineering Hydrology and Hydraulics	Quantitative methods in hydrology and hydraulics providing a theoretical background for water resource management from an engineering perspective. Hydrology topics include precipitation, rainfall losses, storm runoff, unit hydrographs, and statistical hydrology. Hydraulics topics include open channel flow, groundwater flow, floodplain analysis, and flow control structures.	S
ENVE 8450	3	Design for Rapid Change: Food, Energy, Water, and Climate	A global-systems quantitative study, design, model development, and facilitated discussion of global resources, demands, science, engineering,	S

			technologies, and anticipated changes in an era of acceleration.	
MCHE(CHEM) 8970	3	Combustion Science	Fundamental concepts related to the use of hydrocarbons and biofuels as a source of transportation energy for advanced combustion technologies. Topics include chemical bonding, theory/mathematics of combustion, chemical thermodynamics, chemical kinetics, potential energy surfaces, collision theory, ignition dynamics, pollutant formation, and related topics applied to combustion.	S

Letter of Support from the University of Georgia Artificial Intelligence Institute

UNIVERSITY OF GEORGIA

Institute for Artificial Intelligence
518 Boyd Graduate Studies Research Center
200 D.W. Brooks Drive
University of Georgia
Athens, Georgia 30602-7404
TEL 706-542-0881 | FAX 706-542-2966
www.ai.uga.edu

Franklin College of Arts & Sciences
Institute for Artificial Intelligence

February 16, 2023

Dr. Bjorn Birgisson
School of Environmental, Civil, Agricultural and Mechanical Engineering
University of Georgia
Athens, GA

Dear Bjorn,

It is my pleasure to provide this letter of support for your proposal for a new PhD degree program in Civil and Environmental Engineering. The University of Georgia has a very successful Presidential Interdisciplinary Faculty Hiring Initiative in Data Science and Artificial Intelligence that is helping with new faculty hires in Civil and Environmental Engineering. This in addition to the formation of the School of Computing and the growth in the UGA Institute for Artificial Intelligence (AI Institute) opens up novel opportunities for collaboration. The coupling of our AI institute's focus on developing new data science and AI methods with the multitude of applications in Civil and Environmental Engineering holds the promise of both enhancing the national standing of our AI Institute, as well as that of Civil and Environmental Engineering. This also opens new opportunities for collaboration on courses in the future.

It is my hope that the proposed degree program will be approved by the University and the Board of Regents prior to the fall 2023 semester. I am happy to provide additional input as needed and please do not hesitate to contact me.

Sincerely,

Khaled Rasheed

Khaled Rasheed
Professor, School of Computing &
Director of the Institute for Artificial Intelligence
University of Georgia
khaled@uga.edu

Letters of Support from the Industrial Advisory Board for the School of Environmental, Civil, Agricultural and Mechanical Engineering

December 1, 2022

Dr. Bjorn Birgisson
School of Environmental, Civil, Agricultural and Mechanical Engineering
University of Georgia,
Athens, GA

Dear Bjorn,

It is my pleasure to provide this letter in support of your proposal for a new PhD degree program in Civil and Environmental Engineering. As you are aware, I have had the privilege of serving on the Advisory Board for the School of Environmental, Civil, Agricultural and Mechanical Engineering for 5 years. This new program will be an excellent addition to the academic programs already offered to students.

I am a practicing structural engineer with my own engineering firm. I have almost 20 years' experience in the engineering and project management/construction project management industries. Deep engineering expertise is difficult to obtain and difficult to hire—UGA is solving both of those problems by expanding their degree offerings to include this PhD.

It is my hope that the proposed degree program(s) will be approved by the University and the Board of Regents prior to the fall 2023 semester. I am happy to provide additional input as needed and please do not hesitate to contact me.

Best regards,

Amanda Cherry

Amanda Cherry
CEO/President, Abode Engineering

November 29, 2022

Dr. Bjorn Birgisson
School of Environmental, Civil, Agricultural and Mechanical Engineering
University of Georgia,
Athens, GA

Dear Bjorn,

It is my pleasure to provide this letter in support of your proposal for a new PhD degree program in Civil & Environmental Engineering. As you are aware, I have had the privilege of serving on the Advisory Board for the School of Environmental, Civil, Agricultural and Mechanical Engineering for the past two years. This new program will be an excellent addition to the academic programs already offered to students.

I currently serve as the Vice President of Marketing, Member Services and Governmental Affairs at Jackson EMC, an electric cooperative in northeast Georgia. As a cooperative we are owned by the members we serve. And as a cooperative, we strive to provide our over 250,000 members with reliable, affordable electricity and aim to exceed their expectations with the best possible service. In my eleven years at the cooperative, I have seen the evolution of opportunities and challenges impacting the utility industry. The proposed PhD program will develop future leaders who can think critically and strategically to develop solutions to the challenges of today and tomorrow such as resilience and sustainability of infrastructure, renewable and sustainable energy, and energy and environmental policy.

It is my hope that the proposed degree program(s) will be approved by the University and the Board of Regents prior to the fall 2023 semester. I am happy to provide additional input as needed and please do not hesitate to contact me.

Best regards,

Brittany Caison
Vice President, Marketing, Member Services and Governmental Affairs
Jackson EMC
bcaison@jacksonemc.com
706-367-6194

November 16, 2022

IMPACT
PUBLIC AFFAIRS

233 Peachtree St. NE, Suite 1225
Atlanta GA 30303

Dr. Bjorn Birgisson
School of Environmental, Civil, Agricultural and Mechanical Engineering
University of Georgia,
Athens, GA

Dear Bjorn,

It is my pleasure to provide this letter in support of your proposal for new PhD degree program in Mechanical Engineering. As you are aware, I have had the privilege of serving on the Advisory Board for the School of Environmental, Civil, Agricultural and Mechanical Engineering for 3 years. This new program will be an excellent addition to the academic programs already offered to students.

I received my bachelor of science in biological engineering from UGA in May 2001, and while working full-time, I obtained my MBA from UGA in December 2006. I spent half my career in consulting engineering (environmental) before I shifted to public policy. I worked as Deputy Director of the GA Environmental Protection Division before leaving state government to begin my own strategic consulting company. Today I am an owner / partner of Impact Public Affairs, where we work with firms all over the world as they seek growth in Georgia and interact with all levels of government. Every firm that we partner with is seeking quality candidates in engineering – the established engineering programs in Georgia are part of what attracts business to the state. As UGA College of Engineering has matured, the creation of this proposed program is completely justified in my opinion, and I fully support these efforts.

It is my hope that the proposed degree program(s) will be approved by the University and the Board of Regents prior to the fall 2023 semester. I am happy to provide additional input as needed and please do not hesitate to contact me.

Best regards,

L. Russell Pennington, P.E.
Partner, Impact Public Affairs

Documentation of Approval and Notification

Proposal: Major in Civil and Environmental Engineering (Ph.D.)

College: College of Engineering

Department: School of Environmental, Civil, Agricultural, and Mechanical Engineering

Proposed Effective Term: Fall 2023

Approvals:

- Environmental, Civil, Agricultural, and Mechanical Engineering School Chair, Dr. Bjorn Birgisson
- College of Engineering Associate Dean, Dr. Ramaraja Ramasamy
- Graduate School Associate Dean, Dr. Anne Shaffer

Letters of Support:

- Institute for Artificial Intelligence Director, Dr. Khaled Rasheed
- Abode Engineering President and CEO, Amanda Cherry
- Jackson EMC Vice President of Marketing, Member Services, and Governmental Affairs, Brittany Caison
- Impact Public Affairs Partner, L. Russell Pennington, P.E.