BOARD OF SUPERVISORS FOR THE UNIVERSITY OF LOUISIANA SYSTEM

ACADEMIC AND STUDENT AFFAIRS COMMITTEE

April 24, 2025

Item D.3. **Grambling State University's** request for approval to offer a Master of Science in Sustainability.

EXECUTIVE SUMMARY

Grambling State University (GSU) requests approval to offer a Master of Science (MS) in Sustainability. In accordance with *Regents' Academic Affairs Policy 2.05*, the graduate-level proposal was reviewed by an external consultant. Dr. Eric Williams, Professor, Department of Sustainability, Golisano Institute of Sustainability, Rochester Institute of Technology, conducted the review. Dr. Williams noted in his report that *"the course content and concentrations are sound"* as well as *"the program addresses a number of definite needs."* Questions raised by Dr. Williams have been addressed in the final proposal; his feedback resulted in a stronger program concept.

The proposed program will prepare graduates to be the next generation of leaders in the field of sustainability that will be able to address the persistent challenges such as weather events, biodiversity loss, and limitations related to energy sources. Graduates will be well equipped with skills that will support good health and well-being, clean water and sanitation, affordable and clean energy, and sustainable communities. The proposed program is an interdisciplinary program that will include biological sciences, mathematics, engineering technology, public administration, and data analytics. Partnerships with a variety of groups provided input that was useful in designing the proposed program. These partnerships include an MOU between GSU and the EPA, collaborative work with the Community and College Partners Program (C2P2) headquartered in Georgia, IBM Skills Academy, and LUMCON. Three concentrations will be offered and are (1) water and air quality; (2) sustainable energy sources; and (3) green buildings. The common theme for each of these concentrations will be environmental and social improvements for all communities. Each concentration will have thesis and non-thesis options. The proposed program will be delivered in a hybrid format with F2F courses being offered at night to meet the needs of individuals who have work and family obligations.

The need for a graduate-level program in sustainability in Louisiana is increasingly urgent, particularly for undergraduate students who are poised to play a critical role in addressing the state's unique environmental challenges. Louisiana is home to diverse ecosystems, including wetlands, coastal regions, and rich biodiversity, yet it faces significant threats from climate change, habitat loss, and pollution. A graduate program focused on sustainability would equip graduates with the interdisciplinary skills and knowledge necessary to tackle these pressing issues. By integrating ecological principles with social, economic, and policy dimensions, such a program would prepare students to develop innovative solutions that promote environmental stewardship and resilience in local communities. Furthermore, Louisiana's economy heavily relies on

industries such as agriculture, fisheries, and tourism, all of which are impacted by sustainability practices. A graduate program in sustainability would not only enhance the academic and professional prospects for graduates but also foster a new generation of leaders who can advocate for sustainable practices within these vital sectors.

The proposed program is well positioned to prepare students to meet the future workforce needs of not only Northern Louisiana, but also at the state and national levels. As the demand for green jobs grows across various sectors and industries, a clear and urgent need exists for graduates with skills associated with the proposed program. The National Center for O*NET Development indicates a projected employment growth of 8% or higher for Sustainability Specialists nationwide for the period of 2021-31. It is anticipated that 100,000 job openings will need to be filled. The Center indicates an even higher projected growth in the State of Louisiana for sustainability professionals. For the 2018-28 period the expectation is that jobs will grow in this field by 21%.

Existing faculty from various disciplines will provide instructional support; one full-time faculty member will need to be hired along with a program director and administrative assistant. The University anticipates enrollment in YR1 to be 30 with that number increasing to 40 by YR4. Tuition and fees will help offset the cost of program implementation as well as Title III funds, grant funding and donations from external partners. If approved, this would be the first STEM graduate program offered by GSU and a unique program offering in the State of Louisiana.

RECOMMENDATION

It is recommended that the following resolution be adopted:

NOW, THEREFORE, BE IT RESOLVED, *that the Board of Supervisors for the University of Louisiana System hereby approves Grambling State University's request to offer a Master of Science in Sustainability.*

Office of the President

April 1, 2025

MEMORANDUM TO THE BOARD OF SUPERVISORS
OF THE UNIVERSITY OF LOUISIANA SYSTEM

SUBJECT: REQUEST FOR APPROVAL OF AN ACADEMIC DEGREE PROGRAM PROPOSAL TO OFFER MASTER OF SCIENCE DEGREE IN SUSTAINABILITY

Grambling State University (GSU) respectfully requests approval of an Academic Degree Program Proposal to offer a Master of Science degree in Sustainability. The program is designed to prepare graduates to be the next generation of leaders in the field of sustainability that will be able to address persistent challenges such as weather events, biodiversity loss, and limitations related to energy sources. Graduates will be equipped with skills that will support good health and well-being, clean water and sanitation, affordable and clean energy, and sustainable communities.

Your favorable consideration of this request is greatly appreciated.

Sincerely,

Martin Lemelle, Jr., D.B.A.
President

ML:lml
Attachment

GRAMBLING STATE UNIVERSITY'S RESPONSE TO EXTERNAL EVALUATOR'S RECOMMENDATIONS FOR THE PROPOSED MS IN SUSTAINABILITY DEGREE PROGRAM
April 1, 2025

A. Program Design

1. To what extent does the proposed breadth of course offerings represent a broad, well-integrated knowledge of the discipline?

Sustainability is a broad and evolving discipline, there are few norms fixing it to be a particular thing. Within that space, I view the course offerings as consistent with a broad and integrated sustainable degree program.

- **Recommendation 1a:**

2. If the program is interdisciplinary, to what extent is it coherent as a program?

The core classes and proposed concentrations looks coherent to me. However, I think there could be clearer alignment between the stated objectives and program content. To comment on the objectives on page 2:

- Apply system thinking skills to analyze problems and develop solutions in ways that address root causes, connections, and preventative measures.
    - *What is meant by systems thinking skills? What classes is this being addressed in?*

GSU Response to Recommendation 1a:

- The objective regarding system thinking has been revised to state the following: Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. This is reflected in the updated proposal.

- **Recommendation 1b:**

- Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld.
    - *I see knowledge related to content in the classes, but formulation of approaches is not explicitly mentioned.*

GSU Response to Recommendation 1b:

Approaches that are formulated to reduce negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld begin with well-defined objectives and goals for the course. Critical thinking skills are incorporated in all program courses. Other approaches that will be utilized include the following:

➢ **Recommendation 1c:**

- Develop strategies that support sustainable communities.
    - *I don't see this in the curriculum.*

GSU Response to Recommendation 1c:

Developing strategies to support sustainable communities involves a multifaceted approach that addresses environmental, social, and economic dimension is included in the curriculum.
Topics and concepts are designed within the curriculum to address and support sustainable communities.
Concepts related to the enhancement of energy efficiency, creating green spaces, affordable housing initiatives, and the integration of sustainable technology are a part of the concepts addressed.
Waste reduction and recycling along with water conservation are a focus as students relate the associated governmental codes and policies that are relevant.

➢ **Recommendation 1d:**

- Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.
    - *Not sure what this means, is it writing drafts of government bills? Perhaps it's covered in the policy core class, but not explicitly stated.*

GSU Response to Recommendation 1d:

Developing policies is covered in the policy core course (PA 512 Policy Formation/Implementation and Evaluation). Students learn to understand and to analyze the complexities involved in preparing public policy.

➢ **Recommendation 1e:**

One direction to go is to take these objectives and make more explicit how they are to be realized in the classes and program. Note that these objectives appear focused on training students for roles in government and NGOs, these career paths are not given particular attention in the career discussion.

A second direction is to modify objectives to have them match more closely the proposed coursework. The overall course structure looks good.

GSU Response to Recommendation 1e:

In the updated proposal, Grambling State University modified program objectives and mapped the student learning outcomes and program objectives to courses in the curriculum. Career paths for graduates from this program has also been updated.

Program objectives

- Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures.

- •Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld.
- •Develop strategies that support sustainable communities.
- •Use data analytics to sort and analyze large amounts of data to make informed decisions.
- •Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes

Student Learning Outcomes

SLO 1: Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.

SLO 2: Examine and investigate the implications for human- and ecological well-being, including equity, and environmental justice.

SLO 3: Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.

SLO 4: Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.

Concentration 1: Renewable and Sustainable Energy

Course #	Course Name	Program Objective	SLO
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	2, 3
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld	1, 2, 3

		Develop strategies that support sustainable communities	
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
ET 603	Sustainable and Renewable Energy Concepts	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 4
ET 604	Photovoltaic Energy Systems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1,3,4
ET 605	Power System Analysis	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 3,4
ET 606	Grid Design and Operation	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1,3,4
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

		Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.	
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

Concentration 2: Water and Air Quality

Course #	Course Name	Program Objective	SLO
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	2, 3
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4

SU 607	Sustainable Waste Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 608	Advanced Water Quality Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 609	Air Quality Assessment and Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2. 3
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address	1, 2, 3, 4

		specific needs and promote desired sustainable outcomes	

Concentration 3: Sustainable Green Buildings

Course #	Course Name	Program Objective	SLO
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	2, 3
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
ET 610	An Overview of Sustainable Building Technology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
ET 611	Principles of Green Buildings	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
ET 612	Sustainable Materials Methods, and Equipment	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring	1, 2. 3

		fairness and environmental justice are upheld Develop strategies that support sustainable communities	
ET 613	Energy Efficient Building Design	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1,3,4
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.	1, 2, 3, 4
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

3. How well does this program take into account the way the discipline or field is moving?

The academic field of sustainability is too loosely organized and broad to identify a particular direction of evolution. In terms of careers, the concentrations on energy supply and green buildings track well with increased demand in society. In terms of business sustainability, there is more emphasis on carbon accounting in recent years, which is not explicitly in the curriculum.

GSU Response

Course content will constantly be updated to remain current with changes in the field.

4. How well do the requirements (curriculum, research, etc) suit the program? Are they appropriate for a program of high quality?

It is hard to judge quality given that the coursework is described at a high level (one paragraph per course).

5. How do the program's design and its fit with other offerings in the department or college reflect upon its potential viability and growth?

There do not seem to be competing degrees, and there are ungraduated programs that could feed into it, this looks promising.

6. Does the program use alternate, creative forms of delivery? Please address the utility of delivery approaches (including online and/or hybrid) in offering educational opportunities in the proposed program.

No comment.

B. Need

- **Recommendation 2:**

1. Based on your experience and what is provided in the proposal, to what extent do the region, state, or nation need students in this discipline, at this level, at this time?

I will discuss this further below, but I think the proposed coursework and concentrations addresses region/state national needs. I think the articulation of the needs filled ought to be revisited.

GSU Response to Recommendation 2:

The need section of the proposal has been updated to include the following.

The need for a graduate-level program in sustainability in Louisiana is increasingly urgent, particularly for undergraduate students who are poised to play a critical role in addressing the state's unique environmental challenges. Louisiana is home to diverse ecosystems, including wetlands, coastal regions, and rich biodiversity, yet it faces significant threats from climate change, habitat loss, and pollution. A graduate program focused on sustainability would equip graduates with the interdisciplinary skills and knowledge necessary to tackle these pressing issues. By integrating ecological principles with social, economic, and policy dimensions, such a program would prepare students to develop innovative solutions that promote environmental stewardship and resilience in local communities.

Furthermore, Louisiana's economy heavily relies on industries such as agriculture, fisheries, and

tourism, all of which are impacted by sustainability practices. A graduate program in sustainability would not only enhance the academic and professional prospects for graduates but also foster a new generation of leaders who can advocate for sustainable practices within these vital sectors. By emphasizing hands-on learning, research, and community engagement, the program would cultivate a workforce that is adept at navigating the complexities of sustainability challenges. This initiative could ultimately contribute to the long-term economic and environmental health of Louisiana, ensuring that its natural resources are preserved for future generations while addressing the immediate needs of its communities.

2. To what extent is this program likely to address those needs effectively?

The program addresses a number of definite needs. In the renewable/sustainable energy sector, industry needs graduates with energy related expertise for development and implementation of projects. Utilities and Independent System Operators (ISOs) need graduates with energy knowledge. The concentration Water and Air Quality will partly meet a need for environmental science graduates, the sustainability aspects of the degree fills a need in universities and government for people to help manage institutional change. The Green Buildings concentration fills need in industry and government for designing and implementing efficiency and green design.

C. Students

1. How realistic do enrollment projections appear to be?

No comment, I do not know how to evaluate.

2. Does there appear to be an adequate supply of qualified students in the area? Is there enough financial support budgeted to attract able students to this program?

No comment.

- **Recommendation 3:**

3. Are the standards for admission and for measuring performance clear and reasonable? Is there a process for removing unsuccessful students from the program in a fair and timely manner?

The big question in my mind is how technical will the content be and will students be prepared for it? The admission standards do not require one semester of chemistry and biology (or a STEM degree). No mathematics is required beyond what might have been needed for chemistry, which I imagine varies by university. This might be enough, it is hard to tell without a better sense of how technical the content will be. Page 15 states under technical skills" "SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges." *"Selecting and utilizing technologies" can be very technical. Note that the course "Power System Analysis" sounds very technical, close to an electrical engineering course, which calls for more mathematics. I discuss this issue further in response to question J-2.*

GSU Response to Recommendation 3:

As stated in the proposal reviewed by the External Reviewer, students planning to enroll in the MS Degree program in Sustainability will need to have completed a minimum of one semester of General Biology and a minimum of one semester of General Chemistry.

Students who are planning to enter the Green Buildings concentration or Renewable and

Sustainable Energy concentration, will be required to have completed a program with the academic technical foundation to matriculate in the concentration (Engineering Technology, Engineering). Exceptions may be made to those students who can demonstrate relevant professional experience or coursework that is related to the concentration track area they are seeking to enroll or they may be required to complete required undergraduate course as prerequisites to that concentration track.

4. Is the level of performance required in courses and on qualifying and candidacy exams clear and reasonable?

No comment.

D. Faculty

- **Recommendation 4:**

1. Does the department appear to have sufficient faculty strength and stability to successfully launch and maintain this program?

For most of the courses it looks like there is a sufficient cohort of faculty to launch. The main exception is the Green Buildings track, which will require a new hire to deliver. Is the plan to launch without the concentration and hire later, or to hire first? Also, in the energy track, three faculty are listed as potential instructors for Grid Design, but only Dr. Abdul Khaliq looks to have the background to do so.

2. To what extent is the faculty's apparent knowledge and understanding of their areas thorough and up-to-date? Can they cover the proposed range of courses now, adequately?

See comment above.

GSU Response to Recommendation 4:

The qualifications of Engineering Technology Faculty have been updated in the Faculty Roster in the proposal to reflect their qualifications/experiences that support teaching in one of the concentrations.

Faculty knowledge related to green building and sustainable energy areas are enhanced by some of their industrial work experiences, participation with an EPA/GSU MOU and partnerships with local area projects related to stainability. Grambling entered into a Memorandum of Understanding with the U.S. Environmental Protection Agency in which the focus was on preparing students to enter and compete in the federal workforce, providing expertise to review and enhance curriculums, and participate on researching efforts to promote environmental awareness. Two faculty (E. Thomas & L. Elien) developed learning modules that were integrated into courses offered in the department. The learning activities were on issues related to air quality, LEED, and clean/renewable energy. Students learned concepts and reasons why energy-efficient construction techniques are becoming important. Other topics include energy star, solar energy design, and wind energy. Dr. Edwin Thomas has experience working with engineers and architects in supervising students working on campus and community projects that included energy efficient materials. In addition, Dr. Olusegun Adeyemi, PE with an educational background in Mechanical Engineering and Dr. Abdul Khaliq with an educational background in Electrical/Electronic Engineering are both currently receiving training with solar and wind energy. Dr. Adeyemi has also taught wind energy design and concepts in summer workshops. Dr. Benedict Nwokolo, with a background in Civil Engineering, has obtained grants where he has managed and supervised renovations of rural homes in local communities which utilized energy efficient building materials. The department is

currently developing a partnership with a local solar energy company. Recently the faculty of the Department of Engineering Technology was involved in the development of an EPA grant to Promote Sustainable Energy Technologies: Microgrids Systems at Grambling State University and neighboring communities.

The Green Building concentration will not be launched until a faculty supporting this area is hired.

3. What is your impression of the caliber of the faculty's research and publications? How important to the field is the work being done?

I do not work in any of the fields of the faculty listed and I do not have their full CVs, so it is hard to judge. My overall impression is that some of the faculty are very research active, and some are not. Given that this is an M.S. program, I don't think it is critical to have all the faculty be research active.

4. Is the faculty generally recognized nationally, e.g., by appointment to national honorary bodies, committee work, editorial service, or by other recognition?

I see a few examples of yes, but overall I do not see a lot of evidence of national recognition. I do not view this as being critical to the success of the degree program.

5. Is there any indication that excellence in teaching and mentoring is a major consideration?

No comment.

6. Is adequate faculty guidance projected for students with regard to program design, advising, *research, and opportunities for learning beyond the classroom?*

Yes.

E. Resources

1. To what extent do present library holdings or digital access appear adequate to initiate the proposed program?

   I spent some time with the Grambling State U library search engine (https://research.ebsco.com/c/it4jdh/search?) and checked around 15 sustainability journals and found the library subscribed to most of them. So I believe yes, the library holdings are strong/adequate.

   - **Recommendation 5:**

2. What are the limitations of the library in each sub-discipline in which graduate seminars or degree options are offered and theses directed?

   I did notice that the subscription to Energy and Buildings journal ended in 2023, it is a major journal in the green buildings area

GSU Response to Recommendation 5:

Grambling State University has an active subscription to Building and Environment. Faculty will be able to request articles from journals that may not be available in the GSU Library.

3. Are described plans to improve the library's holdings or program resources adequate and realistic?

   It is not clear what the plan is, but I do not think there is an issue to solve.

4. To what extent are facilities and services adequate for the purposes of the program? Do you

sense or perceive any particular inadequacies?

Not that I can see.

F. Administration

- **Recommendation 6a:**

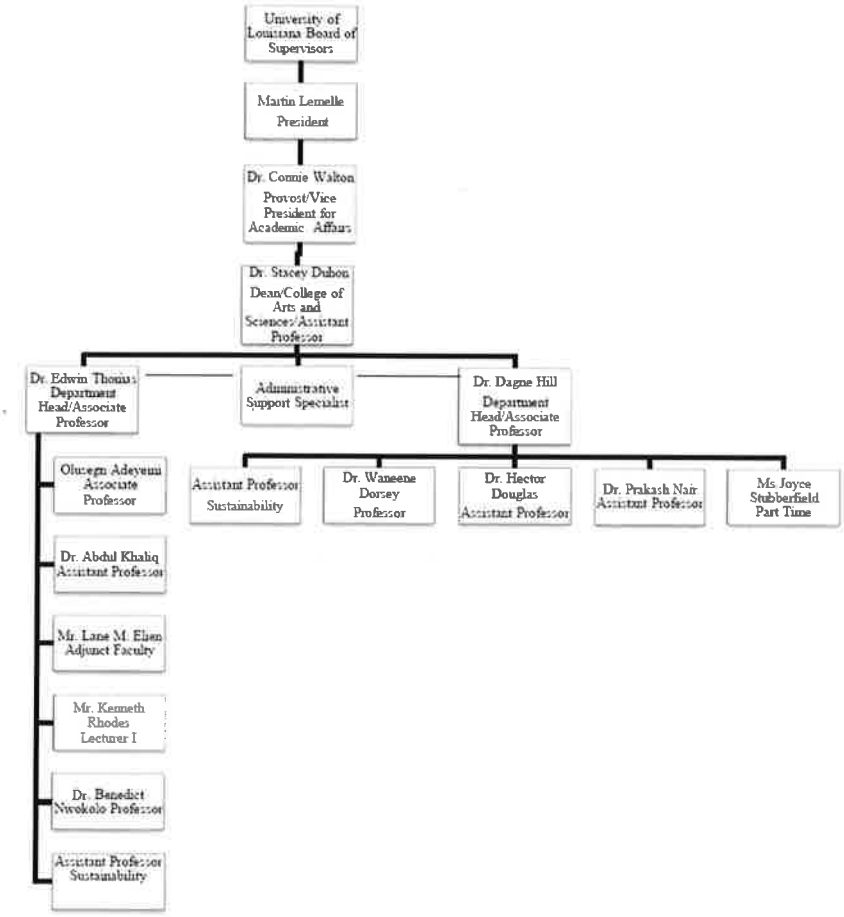
Does the proposed administrative structure appear appropriate? Are there any apparent advantages or disadvantages to this proposed structure?

I do not see a proposed administrative structure. I assume there will be a department chair/program director. I think the number one issue to address is how to evaluate faculty for tenure. The department is situated in a school of biology, how will the faculty member in Green Buildings be appropriately evaluated? Will this person be 100% appointed in Biology or split with another school/college?

GSU Response to Recommendation 6a:

The organizational chart for the proposed program has been included in the proposal. Faculty teaching in the Green Building and Renewable Energy concentration will be tenured in Engineering Technology.

Grambling State University
MS in Sustainability



G. Accreditation

Is information on specialized, programmatic accreditation presented? If not, should it be?

There is no information presented. This is not a problem, the field has few accreditations.

H. Related Fields

Does the program proposal identify sufficient support from related fields or programs? If not, discuss what sufficient support from related supports might be.

I am not sure what this question means, but I discuss contributions of other programs to teaching classes for this degree in my response to question I-4.

I. Costs

- **Recommendation 6b:**

1. Does the proposed budget appear sufficient to launch a quality program?

The estimated budget seems low to me. See below.

2. Are projected costs realistic? Are there elements that are omitted or downplayed that should be in the budget for a quality program of this nature?

   Two faculty lines are assumed to cost $130,000 per year, implying an annual salary of $65,000, which is well below the average salary for Assistant Professor at Grambling. The green buildings hire will probably be from engineering, a field with higher than average salaries. In addition, benefits add to the salary requirement, perhaps the actual number should maybe be about double this.

   Is the program director a department chair, i.e. a faculty member? Or will this be a staff person? There is no budget for staff assistance, who is supporting this function? Note that this role is referred to as a Program Coordinator elsewhere in the proposal.

GSU Response to Recommendation 6b:

The program budgeted approximately $65,000 per faculty ($130,000) which is in line with salaries at the institution. The approximate nine-month salaries for Assistant Professors in Biology and Engineering Technology are $56,100 and $62,061, respectively.

The university acknowledges the omission of fringe benefits in the total salary cost, which will increase the budget by $79,200. This adjustment has been incorporated into the revised budget proposal.

Furthermore, to ensure efficient day-to-day management of the program, the Department of Biological Sciences' administrative assistant along and the department of Engineering Technology's administrative assistant will provide necessary support.

3. Is the amount of financial support projected available sufficient to sustain the program at high quality?

   No comment, I cannot evaluate the prospects for support from Federal Grants.

- **Recommendation 6c:**

4. Is there evidence that institutional support is firmly enough committed for the program to continue at high quality?

There is a major issue I do not see discussed in the proposal: Delivering the program calls for faculty in schools other than Biology to teach courses in the program. Approval of this teaching load presumably requires approval from Deans of those schools, it is not yet clear if this commitment has been obtained.

GSU Response to Recommendation 6c:

All faculty within the proposed program are administratively situated within the College of Arts and Sciences. The Dean of the College of Arts & Sciences has provided a letter of support that is included in the appendices of the proposal.

J. Assessment, Comments, and Suggestions General

- **Recommendation 6d:**

1. Is the proposed program realistic?

In terms of content, I think it is a realistic and solid proposal for a MS degree program. The different concentrations will prepare students for career areas with increasing demand.

It is not clear to me that the institution will commit the necessary resources, in particular the teaching and advising time of faculty in Biology and other schools. There is no administrative support in the budget and the faculty salary items seem too low. Thus, I do not see the current proposal as realistic in terms of documenting the securing of needed resources.

GSU Response to Recommendation 6d:

Grambling State University is committed to adequately funding this program.

2. What are this program's notable strong and weak points?

Strengths: The course content and concentration options are sound. The core is a mix of policy, beginning of environmental science degree, statistics and sustainability overview course. The Renewable and Sustainability track prepare students for careers with energy developers, installers, utilities and ISOs. The Water and Air Quality concentration builds the degree out to as similar to many environmental science programs, with additional sustainability focus. The Green Buildings concentration prepares students for careers in energy efficiency and green building design.

- **Recommendation 7:**

Weaknesses:

The technical skills to be taught in the degree are not made clear. For example, green building classes might include teaching the use simulation software such as Energy Plus. The Sustainable Energy track might include use of solar, microgrid or other design tools (such as HOMER). There are lab components for some courses, what will be taught there? Given more clarity in the technical skills to be taught, are the prerequisites for students appropriate to be prepared for the degree? I think these issues need more attention.

Also, I see only one passing mention of economics in the program description. I don't think every sustainability program has to emphasize economics, but at the very least the basics of assessing a project or technology is a basic skill for sustainability graduates, e.g. calculating Net Present Value.

As mentioned earlier in the review, I think the educational goals and course materials should be more tightly aligned.

GSU Response to Recommendation 7:

The Department of Engineering Technology has developed a course that is similar to the Engineering Economy course currently offered to support the undergraduate program in

Engineering Technology. This course will focus on cost estimates and various economic analysis methods related to the environment and sustainability.

4. Please make any comments regarding aspects of the program not covered in this review or in the proposal which you think should be developed or described.

➢ **Recommendation 8:**

I. ***Career prospects***

I think the proposed 3 tracks all have promising career directions for graduates. However, I don't think the description of careers in the proposal matches these prospects well.

Brownfield Redevelopment Specialists and Site Managers – *these job probably call for more technical depth, e.g. soil science, that would come with a soil science degree. Granted, the Concentration in Water and Air Quality overlaps with an Environmental Science degree, but is there enough depth on soil?*
Chief Sustainability Officer – *MS grads are unlikely to get this position, it is more senior.*
Industrial Ecologist – *This requires training in methods such as Material Flow Analysis and Life Cycle Assessment, not in the program.*
Water/Wastewater Engineers – *These are jobs for Civil Engineering majors.*
Sustainability Specialist – *This position could beat firm, university, or government agency. Especially firms will want their specialists to know about carbon accounting, I don't see this in the curriculum.*

Here are my thoughts on career paths for the three concentrations:

Renewable and Sustainable Energy *– The are career paths in the installation/development of renewable energy projects, such as Solar Installer. The grid coursework connects to jobs at utilities and ISOs on realizing a renewable grid.*

Water and Air Quality *– The concentration plus some of the core overlaps with environmental science and environmental health and safety degrees, so graduates could get these jobs. The sustainability specialists/coordinator jobs at universities, government or firms is probably best supported by this option.*

Sustainable Green Buildings *– There are building related jobs, such as energy efficiency specialists.*

I think the proposal would benefit from first a broader look at career paths (many of which will not have sustainability in the title) and then to make more explicit connections how the program provides needed skills/knowledge needed for these paths.

GSU Response to Recommendation 8:

Career prospects have been updated in the proposal. They are captured below.

Concentration 1 - Renewable and Sustainable Energy – Career Paths

Renewable Energy Engineer Technologist - Manage, develop, and implement renewable energy technologies such as solar, wind, hydro, geothermal, and bioenergy.

Energy Consultant - Advise businesses, governments, or organizations on how to reduce energy consumption, implement sustainable practices, and transition to renewable energy solutions.

Sustainability Manager – Oversee, execute, and implement sustainability strategies within organizations, ensuring their operations are environmentally responsible and energy-efficient.

Energy Storage Engineering Technologist - Focus on the development, testing, and implementation of energy storage technologies to support renewable energy sources (such as batteries or other storage systems).

Solar Energy Engineering Technologist/Technician/Installer - Install, maintain, and repair solar panel systems for residential, commercial, and industrial clients.

Wind Energy Technologist/Technician - Focus on the installation, maintenance, and operation of wind turbines.

Energy Policy Analyst - Research, analyze, and develop policies related to renewable energy, sustainability, and energy efficiency.

Sustainability Manager - Develop and lead sustainability strategies for a company, integrating renewable energy and reducing environmental impacts.

Concentration 2 - Water and Air Quality - Career Paths

Sustainability specialists/coordinator jobs at universities, government or firms

Sustainability Manager
– Oversee, execute, and implement sustainability strategies within organizations, ensuring their operations are environmentally responsible and energy-efficient.

Environmental Consultant
- Environmental consultants assess and advise businesses and organizations on compliance with environmental regulations, helping them manage water and air quality issues. They conduct assessments, analyze data, and recommend strategies for pollution reduction and resource management.

Water Resource Manager
- Water resource managers oversee the sustainable use and management of water resources. They develop policies and programs aimed at ensuring clean water availability, addressing issues like water scarcity, contamination, and watershed management.

Air Quality Specialist

- Air quality specialists monitor and analyze air pollutants, conducting research to assess their impact on public health and the environment. They may work with regulatory agencies to develop air quality standards and strategies for pollution control.

Sustainability Coordinator/Manager**
- In this role, individuals develop and implement sustainability initiatives within organizations or communities, focusing on improving water and air quality through practices like waste reduction, resource efficiency, and community engagement.

Policy Analyst
- Policy analysts research and evaluate environmental policies related to water and air quality. They provide recommendations to government agencies, non-profits, or advocacy groups to support effective legislation and regulatory frameworks.

Concentration 3 - Sustainable Green Buildings Career Paths

Sustainable Construction Manager - Oversee building projects that prioritize sustainable practices and ensure compliance with green building standards.

Green Construction Project Manager - Manage construction projects with a focus on eco-friendly materials, energy efficiency, and waste reduction.

Green Building Certifier – Certify buildings under environmental standards such as LEED, WELL, or BREEAM.

Sustainable Materials Specialist – Advise on or manage the use of sustainable building materials, ensuring that the materials used in construction are environmentally friendly and locally sourced.

Sustainability Policy Advisor – Work with government agencies or organizations to develop policies that promote sustainable development, green buildings, and energy efficiency.

Sustainable Building Materials Specialist – Work with manufacturers of eco-friendly building products, such as insulation, windows, flooring, and wall materials that meet sustainability standards.

Eco-Friendly Building Product Sales Representative – Sell sustainable building materials to architects, developers, and construction companies, helping them make greener choices.

Academic Degree Program Proposal Form

A.A. Policy 2.04: Academic Planning and Degree Program Proposals

A. **Overview**

Institution Name: Grambling State University		Designation (flagship, statewide, regional, HBCU, 2-year): Reginal and HBCU		
College/School/Division: Arts & Sciences		Academic Department: Biological Sciences		
Degree Designation: Master of Science (M.S)	Proposed Degree Name: Sustainability	CIP Code: 30.3301	Credit Hrs[b]: 39	Contact Hrs[c]:
Planned Implementation Semester/Term & Year: Fall 2026		Was this program listed in the most recent Three-year Academic Plan? [X] Yes [ ] No		

[a] See AA Policy 2.11 Approved Academic Terms & Degree Designations

[b] If the program exceeds the standard 60 credits for associate or 120 credits for baccalaureate, you must provide justification and evidence of management board approval according to system policy.

[c] If applicable.

1. Provide a brief description and reason for the development of the proposed program, identifying its purpose and primary objectives.

Grambling State University (GSU) is a co-educational public institution that confers degrees at the bachelor's, master's, and doctorate levels. In bolstering educational opportunities, GSU promotes and fosters a well-rounded, diverse education. The university produces accomplished graduates sought by global employers and top-tier graduate and professional schools.

Grambling State University is proposing to establish an M.S. degree program in Sustainability. The program will prepare graduates to be the next generation of leaders in the field of sustainability that will be able to address persistent challenges such as weather events, biodiversity loss, and limitations related to energy sources. Graduates will be equipped with skills that will support good health and well-being, clean water and sanitation, affordable & clean energy, and sustainable communities. Three concentrations will be offered. These concentrations are water and air quality, sustainable energy sources, and green buildings. The common theme for each of these concentrations will be environmental and social improvements for all communities.

The proposed program is an interdisciplinary program that will include biological sciences, mathematics, engineering technology, public administration, and data analytics. The master's program in Sustainability is aligned with the mission of Grambling State University. Faculty in academic programs across the university, including the interdisciplinary areas that will be a part of the proposed program, have and continue to engage in projects that are meant to make communities better. Examples of projects are captured below:
Sociology Faculty examined the social, economic, and psychological impact of climate change. Sociology faculty have empowered communities in north Louisiana in which a nuclear power plant was identified as a possible location, and the faculty has examined the race differences in the health status of farm workers. Faculty have also engaged in documenting the lives of individuals aged 100 years and older. **Chemistry and Computer Science Faculty** worked to duplicate a project for the state of Louisiana that was conducted by Emory University that focused on the state of Georgia and the linkage of a lack of broadband access by citizens in communities to certain health disparities. The GSU faculty looked for possible links between health disparities and a lack of broadband service in communities in the state of Louisiana. **Chemistry, Physics and Engineering Technology Faculty** researched alternative energy

sources. **Biological Science Faculty** have completed projects that examined wastewater to identify possible new strains of the coronavirus and projects that examined the negative health impacts of specific chemicals used to preserve wood for certain applications. Biology Faculty are currently working on a sustainability project that focuses on the Gulf of Mexico. Grambling State University has taken a multidisciplinary approach to sustainability by bringing together experts from diverse fields to address the complex challenges facing the Gulf of Mexico. Faculty members in seven departments have collaborated to develop and incorporate aspects of environmental and socioeconomic sustainability into both the curriculum and research projects. One Biological Sciences faculty member is using Next Generation Sequencing to investigate the soil and water microbial communities in wetland ecosystems. Another faculty member is conducting field research on hydrophytes in the Barataria-Terrebonne estuary system. **Engineering Technology Faculty** are infusing topics that focus on green buildings into the content provided in several courses. Engineering Technology students have designed devices that improve existing technology that could better the lives of citizens.

Graduates from the proposed program will be able to do the following:

- Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures.
- Formulate approaches to reduce the negative effects on human and environmental well-being.
- Develop strategies that support sustainable communities.
- Use data analytics to sort and analyze large amounts of data to make informed decisions.
- Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

The program will accomplish the following:

- Recruit a pool of highly motivated and qualified students to pursue a graduate degree in Sustainability.
- Provide advanced training in sustainability for individuals who are already in or wish to pursue careers in industry, government, and education.
- Develop independent, competitive, and well-trained environmentally literate professionals with strong interpersonal communication skills.
- Provide students with the tools and techniques needed to be able to successfully navigate into the sustainability-related workforce upon graduation.

2. Describe specialized accreditation requirements associated with the program if applicable (refer to Board of Regents A.A. Policy 2.13: Program Accreditation). If not required, describe whether the institution will seek any voluntary accreditation or certification for the program.

   Currently, there is no plan to seek a discipline-specific accreditation for this proposed graduate program. The proposed program will not negatively impact GSU's SACSCOC accreditation.

3. Specify **SACSCOC** or other accreditation organization requirements. Mark all that apply.
   [ ] Substantive change requiring notification only
   [X] Substantive change requiring approval prior to implementation
   [ ] Level Change
   [ ] None

4. Has the program been designed to align with any Board of Regents or other statewide initiatives? Check all that apply.
   [ ] MJ Foster Promise Program
   [ ] Cyber-security Initiatives
   [ ] Louisiana Transfer Pathways
   [ ] Other:_____

5. If this proposal is for a Master's or Doctoral program, provide a list below (name, institution, email address, brief summary of qualifications) for at least three external review candidates. Reviewers should be active or retired full time faculty member from an accredited institution; have experience developing and/or administering a program like the proposed program; and should not have direct affiliation with a Louisiana institution.

1. Dr. Joshua K. Abbott
Acting Director and Professor
Arizona State University
School of Sustainability, Tempe, AZ,
Joshua.K.Abbott@asu.edu

Dr. Abbott is the Acting Director of the School of Sustainability at Arizona State University. His research and teaching concerns economic dimensions of sustainable resource governance, with a focus on sustainable oceans, water policy, and the economic valuation of natural capital.

2. Dr. Lindi Dorothee von Mutius
Director
Harvard University
Climate Action Accelerator
lindi_vonmutius@harvard.edu

Dr. Lindi Dorothee von Mutius has held senior roles at the Environmental Defense Fund and the Trust for Public Land, and served as Chief of Staff of the Sierra Club. Her expertise is in environmental law and lobbying, specifically around energy policy and land conservation. Her professional background has spanned working in government, lobbying, and litigation. Dr. Dorothee von Mutius experiences have allowed her to pursue her passion: leading efforts towards improved sustainability, conservation and environmental justice outcomes.

3. Dr. Shea Tuberty
Appalachian State University
Professor
Invertebrate Physiology and Aquatic Ecotoxicology Department of Biology
tubertysr@appstate.edu.

Dr. Tuberty has a passion for the sustainable management of water resources. In recent years he has worked on the endocrine disrupting effects of sewage effluents on fish, industrial chicken litter soil amendment practices on soil and water quality and impacts of coal ash spills on water quality and aquatic community assemblages or rates of toxic metal bioaccumulation. Dr. Tuberty joined Environmental Stewards Consulting, Inc., a non-profit that serves as technical advisor to communities impacted by hazardous waste sites, as a board member and treasurer. Recently, his lab has focused on the impacts of road salts and sewage effluents on S. Appalachian headwater streams.

B. The Master Plan and Institutional Role, Scope, and Mission

6. How does the program align with your institutional role, scope, and mission? If the program does not align, provide a compelling rationale for the institution to offer the program.

The Master of Science in Sustainability will be the first graduate-level STEM program at the university. This program is aligned with the role, scope, and mission of the university.

Grambling State University is an HBCU that was founded in 1901 by African American Farmers who wanted a quality education available for their children. The Louisiana Board of Regents recognizes Grambling as both a regional university and an HBCU. Our mission includes statements that acknowledge the fact that the university prepares graduates to (1) compete and succeed in careers related to their program of study, (2) contribute to the advancement of knowledge and (3) to commit to improving the quality of life for others. The proposed program supports the mission of Grambling State University.

The Board of Regents captures our role scope and mission in a document published on their webpage (Microsoft Word - 2012 0427 - MasterPlan Revised 04-27.docx (laregents.edu). This document acknowledges that Grambling State University is primarily considered as a teaching institution. The Board of Regents recognizes that our degree inventory includes professional programs and programs at the master's level and doctoral level. GSU offers master's level programs in areas that include education, nursing, public administration, social work, social science, mass communication, criminal justice, and sports management. Also recognized by the Board of Regents is the university's role as an HBCU in addressing critical workforce needs in the state of Louisiana as well as on the national level. The proposed master's degree in sustainability is aligned with our role as an HBCU as well as with faculty expertise that supports bachelor's and master's level programs. As stated in an earlier section, the proposed program is consistent with the research of faculty that has been and continues to be infused in curricula ensuring that students acquire skill sets that make them highly competitive when seeking professional experiences, internships, jobs, and admission into professional and graduate-level programs. It is appropriate to offer this STEM infused master's level program in sustainability that will meet regional, state, national, and international needs.

Grambling State University, as approved by the Louisiana Board of Regents, has a Center of Academic Excellence that focuses on mathematical achievement in science and technology. Our Engineering Technology programs and Computer Science program are accredited by the appropriate division of ABET. The Chemistry program is certified by the American Chemical Society's Committee on Professional Training. Each of these recognitions speaks to the strength of our STEM programs. Furthermore, the proposed degree program marries a STEM focus with sociology and public administration.

7. How does the program align with your institution's strategic plan and academic program portfolio?

Alignment with the University's Strategic Plan

The proposed program aligns with Grambling State University's Strategic Plan by addressing Goal II: Increase Opportunities for Student Success and Objective 11.5: Increase the total number of Graduate Degree completers. The Master of Science in Sustainability program will support increasing the number of students completing graduate degrees. The proposed program is aligned with providing a quality education while fostering student success.

Alignment with Master Plan for Higher Education

The proposed program is aligned with the Louisiana's Master Plan for Higher Education. This plan includes improving the educational attainment of citizens by increasing the retention and graduation of students and targeting adults who have some college training. Academic programs offered at the bachelor's level are inevitably made stronger when a graduate degree is offered in that area. This is due to the benefits that undergraduate students will realize because of faculty remaining current in their discipline via graduate-level research. Cutting-edge research results generated by faculty supporting the proposed program will be infused into undergraduate curricula. Undergraduate students will have the opportunity to engage in research alongside graduate-level students. Data shows that undergraduate students are retained and graduate when research is a part of their academic experience.

An additional way the proposed program is aligned with the Master Plan is it will increase the educational attainment of adults at the master's level. The program will be attractive to adults who have a desire to change their job focus. These adults may have earned a bachelor's degree or completed some graduate-level coursework. Completing the degree requirements for the proposed program will increase the educational attainment level for these adults.

The curriculum for the proposed program will infuse stackable credentials that ultimately will enhance the skills of graduates from this program. Stackable credentials are a part of the Master Plan for Higher Education. The stackable credentials that will be infused into specific courses in the program include the following.

* Getting Started with Enterprise Data Science (IBM Course)
* Getting Started with Threat Intelligence and Hunting (IBM Course)
* Sustainability Excellence Associate (SEA) Credential
* Leadership in Energy and Environmental Design (LEED) Certification

The MS degree in sustainability supports the acquisition of skills by graduates that will be beneficial to many of the key industries identified by the Louisiana Economic Development. These industries include agribusiness, energy, and water management.

Alignment with the Academic Portfolio

The proposed program in sustainability is aligned with Grambling State University's academic portfolio. It will build on foundational skills that undergraduate programs in STEM and the social sciences provide. This program also supports key areas addressed by undergraduate programs; societal challenges, innovation and entrepreneurship, and meeting workforce demands. These three areas are addressed below.

1. Addressing Societal Sustainability Challenges- The sustainability program will afford Grambling State University the ability to actively contribute to addressing challenges related to climate change, resource management, and social justice & equity. The program will provide students with the tools needed to develop sustainable solutions and make a positive impact in communities.

2. Fostering Innovation and Entrepreneurship- To successfully address sustainability issues, innovative thinking and entrepreneurial approaches to develop sustainable practices and technologies are required. Graduates of the program will be equipped with the knowledge and skills that are needed to be able to design and implement sustainable initiatives.

3.Meeting Industry Demand -There is a growing demand for professionals with expertise in sustainability across various sectors, including government, corporations, nonprofits, and educational institutions. The proposed program in sustainability will provide both the skills and the knowledge that are in high demand in the job market. This will expand the university's academic portfolio of programs that are aligned with workforce needs. Graduates from the proposed program will contribute to the university's mission of providing a quality education and preparing students to be leaders in their respective fields.

8. **How does the program align with the priorities outlined in the Board of Regents Master Plan for Higher Education? Provide brief descriptions for each. Additional details will be required later in the proposal.**

- **Accessibility (mode of delivery, alternate course scheduling)**

This program will be accessible to individuals who have work and family demands that place restrictions on their availability. The proposed program will be delivered in a hybrid format. Students will take courses that are offered 100% online as well as complete certain aspects of the program on the GSU campus. On-campus requirements will be offered at times that will not interfere with the traditional 8:00 am-5:00 pm work schedule.

- **Affordability (use of OER, transfer agreements, prior learning assessment, employer-funded)**

Open educational resources will be used to support this program. These OERs will be aligned with content covered in specific courses. The average master's student could spend $1,000.00 or more each year on textbooks. Using OER texts will result in significant savings for students.

The university will facilitate a process for tuition payment by employers that provide financial support for an employee to pursue this degree.

- **Partnerships (with industry, community-based organizations, other institutions)**

Partnerships with a variety of groups provided input that was useful in designing the proposed program. These partnerships include a Memorandum of Understanding (MOU) between Grambling State University and the United States Environmental Protection Agency (EPA), collaborative work with the Community and College Partners Program (C2P2) headquartered in Georgia, IBM Skills Academy, and Louisiana Universities Marine Consortium (LUMCON)

United States Environmental Protection Agency (EPA)-Grambling State University has a MOU with the United States Environmental Protection Agency (Region 6). The MOU targets Region 6 and the Office of Enforcement and Compliance Assurance (OECA) working collectively to progress efforts focusing on preparing students to enter and compete in the federal workforce, providing expertise to review and enhance curricula, and research to promote environmental awareness. The EPA is available to provide advice and information useful in restoring, maintaining, and enhancing the quality of the environment.

Community and College Partners Program (C2P2) headquartered in Georgia-The goal of the Community and College Partners Program (C2P2) is to provide technical services to underserved communities for self-identified needs and to help identify resources by which the plans are developed. C2P2 enlists colleges and universities, such as Grambling State University, to assist underserved communities with vital technical support through classroom work, capstone, and practicum projects. C2P2 provides practical experiences for students in areas of sustainability studies. GSU students are currently engaged in a sustainability project that focuses on a county in North Carolina.

IBM Skills Academy-IBM's investment in Grambling State University is part of the company's efforts to create innovative experiences for students to acquire the necessary skills to unlock economic opportunity and prosperity. As part of the Skills Academy Academic Initiative, IBM provides digital badges, software, student training, and faculty training. The IBM Skills Academy is a comprehensive, integrated program designed to create a foundation of diverse and high-demand skill sets that directly correlate to what students will need in the workplace. The earning tracks address topics such as data science, artificial intelligence, cybersecurity, blockchain, design thinking, and quantum computing.

Louisiana Universities Marine Consortium (LUMCON)=LUMCON as a consortium is a statewide academic endeavor to focus and strengthen the effectiveness of foundational marine science that is needed to address the environmental challenges facing Louisiana and the nation. LUMCON's mission is to promote, facilitate, and conduct research and education collaborations among Louisiana's universities in marine and coastal sciences relevant to the sustainability of coastal and marine environments of the Gulf of Mexico. GSU has had a longstanding history of collaboration with LUMCON via the NSF-funded Research Experiences for Undergraduates (REU) site program. LUMCON established a new fellowship program that is designed to support the research of graduate students from underrepresented groups in STEM. The program provides the selected applicants with the opportunity to complete a summer in residence at LUMCON where they can take advantage of LUMCON's unique location and facilities and opportunities to work with LUMCON Scientists. Students enrolled in the proposed program will fit well within the existing education programs offered by LUMCON.

- **Work-based learning (paid or experiential internships, apprenticeships, etc.)**

Each of the three program concentrations has a thesis and a non-thesis option. The non-thesis option of the proposed program requires six credit hours of professional internship experience (SU 699L). Students in this course (SU 699L) will participate in a work-based learning experience. The desire is the experience will provide compensation for the student.

- **Other program attributes that contribute to closing the achievement gap with underserved populations including low income, minority, and adult learner.**

In response to the climate crisis, industries continue to have a focus on decarbonization. The need for green jobs and sustainability professionals increases each year. The proposed program will increase the number of adults in the state of Louisiana who have attained a degree in higher education at the master's level. The program is also likely to close gaps in the educational attainment for minorities as well as increase the earning power of those that graduate from the program.

C. Need

9. How does the program align with relevant local, regional, and/or state workforce strategies and future societal educational needs?

The need for a graduate-level program in sustainability in Louisiana is increasingly urgent, particularly for undergraduate students who are poised to play a critical role in addressing the state's unique environmental challenges. Louisiana is home to diverse ecosystems, including wetlands, coastal regions, and rich biodiversity, yet it faces significant threats from climate change, habitat loss, and pollution. A graduate program focused on sustainability would equip graduates with the interdisciplinary skills and knowledge necessary to tackle these pressing issues. By integrating ecological principles with social, economic, and policy dimensions, such a program would prepare students to develop innovative solutions that promote environmental stewardship and resilience in local communities.

Furthermore, Louisiana's economy heavily relies on industries such as agriculture, fisheries, and tourism, all of which are impacted by sustainability practices. A graduate program in sustainability would not only enhance the academic and professional prospects for graduates but also foster a new generation of leaders who can advocate for sustainable practices within these vital sectors. By emphasizing hands-on learning, research, and community engagement, the program would cultivate a workforce that is adept at navigating the complexities of sustainability challenges. This initiative could ultimately contribute to the long-term economic and environmental health of Louisiana, ensuring that its natural resources are preserved for future generations while addressing the immediate needs of its communities.

The proposed program is well-positioned to prepare students to meet the future workforce needs of not only Northern Louisiana, but also at the state and national levels. As the demand for green jobs grows across various sectors and industries, a clear and urgent need exists for graduates with skills associated with the proposed program. The National Center for O*NET Development indicates a projected employment growth of 8% or higher for Sustainability Specialists nationwide for the period of 2021-2031. It is anticipated that 100,000 job openings will need to be filled. The National Center for O*NET Development indicates an even higher projected growth in the state of Louisiana for Sustainability professionals. For the 2018-2028 period the expectation is that jobs will grow in this field by 21%. Job projections for this same time frame for the states of Arkansas, Georgia, Texas, and Florida are 6%, 19%, and 29% respectively.

10. Summarize faculty engagement with alumni, community representatives, employers, Regional Economic Development Organizations (REDO) or other external stakeholders, and explain how those conversations shaped the design and curriculum of this proposed degree.

The University has an articulation with the U.S. Environmental Protection Agency (Region 6). The proposed curriculum was shared with employees of this federal agency for feedback. One of the employees who provided feedback is a GSU alumnus. Valuable feedback was provided regarding course design. Courses were both added and deleted based on these conversations.

Discussions were had with some board members of the Delta Agriculture Research & Sustainability District. Suggestions regarding the formulation of program concentrations that could meet the needs of a variety of learners and industries were made. Some of these recommendations were incorporated into the proposed program.

11. What is the program's service area (local, regional, state, national)? If outside of the institution's traditional service area, provide a rationale.

Grambling State University services students at the regional, state, national, and international levels. The proposed program will continue to serve these areas.

12. Provide evidence of demand for the program in this service area (e.g. prospective student interest survey data, community needs, letters of support from community groups or employers).

The proposed M.S. in sustainability program will fulfill a need that exists for a STEM-related sustainability graduate program. As more focus is being placed on the importance of caring for the environment, there is a need to prepare students to meet this growing workforce demand. The program will cultivate future employees of the state of Louisiana, the southern region, and the nation.

Many students have expressed interest in the proposed program. An interest survey was administered to students. A total of 401 students were surveyed. From the data collected, more than 82% of the surveyed students showed an interest in the proposed STEM graduate degree program in sustainability. The potential sources of students will be STEM and non-STEM graduates who have interests in the field of sustainability. The proposed sustainability degree program will increase university enrollment due to its statewide uniqueness and link to workforce opportunities for program graduates.

Letters of Support

Letters of Support have been received from the following individuals and are provided in Appendix A.

Mr. Pon Dixon
US Department of Interior
Fish and Wildlife Service
Southeast Louisiana Refuges
61389 Hwy 434
Lacombe, LA 70445
pon_dixson@fws.gov

Travis Johnson
State Representatives/District 21
200 Advocate Row, Suite D
Vidalia, LA 71373
hse021@legis.la.gov

Brian J. Roberts
Executive Director and Chief Scientist
Ecosystem Ecology and Biogeochemistry Lab | REU Program Director
Louisiana Universities Marine Consortium
8124 Highway 56
Chauvin, LA 70344
broberts@lumcon.edu

D **Thanos Smith**
Chief Visionary Officer
The Paragon Universe
www.paragonvtol.com

13. What is the employment outlook for occupations related to the program?

You may find this information using the following information sources among others:

a. EMSI's Program Overview Report (check with your Office of Academic Affairs for access)
b. Louisiana Workforce Commission
c. US Department of Labor Projections Managing Partnership
d. The NCES CIP to SOC crosswalk.

If data for the program's service area is not available, then use state- or national-level data and indicate below.

No programs that are the same or similar to the proposed master level program are currently offered. A post baccalaureate certificate program is being offered by Southeastern Louisiana University.

[ ] Service Area Data [X] Sate Data [ ] National Data

Related Occupation	LWC Star Rating	Current Employment [2020]	Projected Employment [2030]	# Change	% Change	Average Annual Openings	Average Salary
Industrial Ecologist	4	1,070	1,140	70	7%	110	$60,180
Urban and Regional Planning	4	260	290	30	12%	30	$63,080
Conservation Scientist	5	730	720	-10	-1%	70	$63,320
Sustainability Specialists		21,840	23,330	1,490	7%	1,780	$60,180
Environmental Scientist and Specialist, including Health	4	84.6	90.7	6.1	7.3	8.5	$78,980

14. **List other institutions within the service area that offer the same or similar programs and include the number of graduates from within the last year. This information is available through IPEDS, EMSI's Program Overview Report and BOR Searchable CRIN.**

Institution	Program (degree and title)	No. Graduates in past year
Southeastern Louisiana University (SLU)	PBC: Sustainability	1

15. **Based on the data provided in questions 13 and 14, discuss how this program will help address a need or gap in the labor market, or provide education to further the public good.**

Communities in Louisiana and across the nation are plagued with sustainability problems related to climate change, environmental justice issues, environmental disasters, and energy sources. There is a critical need for Louisiana institutions of higher education to produce graduates who are knowledgeable in the field of sustainability and have skills to develop mechanisms and programs that mitigate the effects and aftermath of natural and manmade issues. Additionally, there is a need for professionals who can monitor or track sustainability indicators.

As stated earlier, the proposed program is well positioned to prepare students to meet the future workforce needs of the state and the nation. Graduates from this program will be poised to fill gaps that exist in the availability of specialists in the field of sustainability. Green jobs, and a workforce with the skills to fill them, are essential for addressing the needs of communities. According to LinkedIn, employers have increased green job hiring rates, with year-on-year green job growth exceeding the overall hiring rate growth every year since 2019. This increase has resulted in sustainability jobs making up three of the top ten fastest-growing areas. These jobs include Sustainability Analysts, Sustainability Specialists, and Sustainability Managers. According to LinkedIn's Green Economy Report titled LinkedIn's Economic Graph. Global Green Skills Report 2022 (https://economicgraph.linkedin.com/content/dam/me/economicgraph/en-us/global-green-skills-report/globalgreen-skills-report-pdf/li-green-economy-report-2022.pdf), the number of jobs in the field of Renewables and Environment has increased by 237%. This report also indicates jobs that have not been considered as "green jobs" are seeking applicants that have some training in sustainability.

The National Center for O*NET Development indicates a projected growth for Sustainability Specialists that is faster than average, increasing 8% or more for the 2021-2031 period. This sustainability profession is also projected to have 100,000 or more job openings in the US over the period 2021-2031. The National Center for O*NET Development indicates an even higher projected growth of 21% for the state of Louisiana expected to occur between the years 2018-2028. As stated earlier the National Center for O*NET Development also projects job growth for the states of Arkansas, Georgia, Texas, and Florida (6%, 19.0%, 22%, and 20% respectively). Heightened public interest in the potential hazards facing the environment, as well as the increasing demands that are placed on the environment by population growth, are projected to spur the demand for sustainability professionals. Graduates of the proposed program will be equipped with the knowledge to evaluate and employ a plan to address issues associated with sustainability and resiliency. Many jobs are expected to remain concentrated in both state and local governments and in industries across the spectrum. Program course offerings will prepare graduates to assume positions as Climate Change Analysts, Energy and Sustainability Strategic Advisors, Sustainable Design Coordinators, Waste Management Specialists, Environmental Restoration Planners, and Sustainability Ecologists. Because of the growing need for expert guidance, businesses and industry are expected to continue to consult with specialists to help them reduce the impact that their operations have on the environment. Experts in Sustainability will develop practices that minimize waste, prevent pollution, and conserve resources while also assisting with a plan of action to mitigate or prevent environmental damages. Sustainability experts will also be able to address organizational sustainability issues such as green building practices and green procurement plans as well.

In addition to the previous careers listed in #13, additional career paths that align with the proposed concentrations are listed below:

Concentration 1 - Renewable and Sustainable Energy – Career Paths

Renewable Energy Engineer Technologist - Manage, develop, and implement renewable energy technologies such as solar, wind, hydro, geothermal, and bioenergy.

Energy Consultant - Advise businesses, governments, or organizations on how to reduce energy consumption, implement sustainable practices, and transition to renewable energy solutions.

Sustainability Manager – Oversee, execute, and implement sustainability strategies within organizations, ensuring their operations are environmentally responsible and energy-efficient.

Energy Storage Engineering Technologist - Focus on the development, testing, and implementation of energy storage technologies to support renewable energy sources (such as batteries or other storage systems).

Energy Policy Analyst - Research, analyze, and develop policies related to renewable energy, sustainability, and energy efficiency.

Sustainability Manager - Develop and lead sustainability strategies for a company, integrating renewable energy and reducing environmental impacts.

Concentration 2 - Water and Air Quality - Career Paths

Sustainability specialists/coordinator jobs at universities, government or firms

Sustainability Manager– Oversee, execute, and implement sustainability strategies within organizations, ensuring their operations are environmentally responsible and energy-efficient.

Environmental Consultant- Environmental consultants assess and advise businesses and organizations on compliance with environmental regulations, helping them manage water and air quality issues. They conduct assessments, analyze data, and recommend strategies for pollution reduction and resource management.

Water Resource Manager- Water resource managers oversee the sustainable use and management of water resources. They develop policies and programs aimed at ensuring clean water availability, addressing issues like water scarcity, contamination, and watershed management.

Air Quality Specialist- Air quality specialists monitor and analyze air pollutants, conducting research to assess their impact on public health and the environment. They may work with regulatory agencies to develop air quality standards and strategies for pollution control.

Sustainability Coordinator/Manager- In this role, individuals develop and implement sustainability initiatives within organizations or communities, focusing on improving water and air quality through practices like waste reduction, resource efficiency, and community engagement.

Policy Analyst- Policy analysts research and evaluate environmental policies related to water and air quality. They provide recommendations to government agencies, non-profits, or advocacy groups to support effective legislation and regulatory frameworks.

Concentration 3 - Sustainable Green Buildings Career Paths

Sustainable Construction Manager - Oversee building projects that prioritize sustainable practices and ensure compliance with green building standards.

Green Construction Project Manager - Manage construction projects with a focus on eco-friendly materials, energy efficiency, and waste reduction.

Green Building Certifier – Certify buildings under environmental standards such as LEED, WELL, or BREEAM.

Sustainable Materials Specialist – Advise on or manage the use of sustainable building materials, ensuring that the materials used in construction are environmentally friendly and locally sourced.

Sustainability Policy Advisor – Work with government agencies or organizations to develop policies that promote sustainable development, green buildings, and energy efficiency.

Sustainable Building Materials Specialist – Work with manufacturers of eco-friendly building products, such as insulation, windows, flooring, and wall materials that meet sustainability standards.

Eco-Friendly Building Product Sales Representative – Sell sustainable building materials to architects, developers, and construction companies, helping them make greener choices.

16. What impact will the proposed program have on similar or related programs at your institution?

There are no other STEM graduate programs at the university. It is expected that the addition of the proposed graduate program will increase the number of undergraduate STEM students who elect to continue their education and pursue a graduate degree at GSU. The proposed program is also expected to increase overall graduate student enrollment numbers at the university, by recruiting new students to the university and providing a program that will attract diverse populations.

17. **Using data from the US Department of Labor O*-Net and/or EMSI's Program Overview Report identify at least three technical skills and three Knowledge, Skills, and Abilities (KSAs) as identified in O*-Net/EMSI associated with the related occupations.**

Occupation	Occupation-specific skills & KSAs
Sustainability Specialist • Campus Energy Coordinator • Energy and Sustainability Strategic Advisor • Sustainability Advisor • Sustainability Consultant • Sustainability Coordinator • Sustainability Specialist • Sustainable Design Consultant • Sustainable Design Coordinator **Environmental Scientist and Specialist, including Health** **Chief Sustainability Officers** • Sustainability Chief • Sustainability Director • Sustainability Initiatives Vice President (Sustainability Initiatives VP) • Sustainability Manager • Sustainability Programs Director • Sustainable Design Director	**Technical Skills:** • Utilization of Analytical/scientific software to assess and provide solutions for Sustainability issues • Data analysis utilizing data base user interface and query software • Writing utilizing desktop publishing software **Knowledge:** • Administration and Management • Law and Government • Education and Training **Skills:** • Writing • Critical Thinking • Problem Solving **Abilities:** • Oral Comprehension • Deductive Reasoning • Oral & Written Communication

D. Curriculum

18. List at least three programmatic student learning outcomes (what students will know and be able to do). Describe how and when outcomes will be assessed.

Graduates from this program will be able to do the following:

SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.

SLO 2-Examine and investigate the implications for human- and ecological well-being, including equity, and environmental justice

SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.

SLO 4- Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.

Assignments, exams, case studies, projects, non-thesis internship 50-page paper, thesis, and written reports will be used to evaluate students' progress and competency in achieving the programmatic student learning outcomes. Program faculty will assess students' work based on rubrics that align with specific outcomes. Additionally, feedback from industry professionals via the use of external advisory boards will play a critical role in assessing the program. Continuous program improvement will be derived from the feedback and assessment results collected. The assessment process will be leveraged to ensure that students are developing the necessary skills and knowledge in the field of sustainability.

19. **The National Association of Colleges and Employers (NACE) provides the list of career ready competencies included in the table below. How do the student learning outcomes for the proposed program align with these career competencies? You may also list your institution's alternate career-based competencies if applicable.**

Career Ready Competencies (NACE)	Student Learning Outcomes
Critical Thinking/Problem Solving	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 2- Examine and investigate the implications for human- and ecological well-being, including equity, environmental justice. SLO 4 -Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Oral/Written Communications	SLO 4 -Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Teamwork/ Collaboration	SLO 4 -Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Digital Technology	SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
Leadership	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Professionalism/ Work Ethic	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 2-Examine and investigate the implications for human- and ecological well-being, including equity, environmental justice. SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.

Career Management	SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Equity and Global/Intercultural Fluency	SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.

20. List the specific technical skills and KSAs identified in question 17 and show how they relate to the program's student learning outcomes. Insert additional rows as needed.

Technical Skills and KSAs	Student Learning Outcome (s)
TECHNICAL SKILLS	
Utilization of Analytical/scientific software to assess and provide solutions for Sustainability issues	SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
Data analysis utilizing data base user interface and query software	SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
Writing utilizing desktop publishing software	SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
KNOWLEDGE	
Administration and Management	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Law and Government	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 2- Examine and investigate the implications for human- and ecological well-being, including equity, & environmental justice.
Education and Training	SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
SKILLS	
Writing	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions. SLO 3-Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.
Critical Thinking	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.

Problem Solving	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.
ABILITIES	
Oral Comprehensive	SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.
Deductive Reasoning	SLO 1-Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.
Oral & Written Communication	SLO 4-Effectively communicate and collaborate with diverse stakeholders to plan, develop and implement sustainable solutions.

21. The American Association of Colleges & Universities identifies a list of high impact educational teaching and learning practices (HIPs) listed below (see https://www.aacu.org/trending-topics/high-impact). Briefly describe how the program will utilize those HIPs that are applicable, including whether it is optional or required.

AACU HIPs	
First Year Experience	N/A
Undergraduate Research	N/A
Common Intellectual Experiences	Core courses will include exposure to scientific conferences and seminars.
Diversity/Global Learning	Diversity and global sustainability experiences will be explored in core courses.
Learning Communities	N/A
e-Portfolios	N/A
Writing Intensive Courses	Students pursuing the thesis option will enroll in Thesis Research I and II courses. These courses require intensive writing.

Service-Learning, Community-based Learning	Field-based "experiential learning" with community partners will be integrated into certain courses.
Collaborative Assignments & Projects	Research and projects will require collaboration.
Internships	Students pursuing the thesis option will have the option to obtain mentorship at other facilities as they delve into their thesis research. Students not on the thesis option will have the ability to participate in internship experiential experiences.
Capstone Courses and Projects	Students electing the non-thesis option will enroll in the course SU 699L Professional Internship Experience as they seek to engage and to gain practical experiences in the field of sustainability. Students electing the Thesis option will undertake a research-based approach. They will enroll in SU 698 MS Thesis Research I – Sustainability and SU 699 MS Thesis Research II – Sustainability as they conduct in-depth research and prepare their program associated thesis.

22. Attach a map of the curriculum by semester for a full-time student enrolled in at least 15 units per semester. This may be structured like a program of study in the general catalog or on a curriculum guide.

- Include course prefixes, numbers, titles, and credit hour requirements. Identify courses that meet general education requirements.
- Include alternate tracks and requirements by concentration if applicable. Identify courses that are applicable to the alternative tracks.
- List all major course requirements. Indicate the word "new" beside new courses.
- Indicate work-based learning experiences (such as internships, clinicals etc.) if applicable.
- Provide a summary of how the curriculum meets the learning outcome goals described in questions 18-21.

This information can be found in Appendix B.

23. Check all proposed program modes of delivery that apply:

[ ] On campus (<50% online)
[X] Hybrid (51-99% online)
[ ] 100% online

24. Describe how students will have the opportunity to receive credit for prior learning in the program's curriculum. (see Board of Regents Policy AA 2.23)

The proposed program will give students credit for certificates that were earned prior to enrolling in the program that have been integrated into the curriculum.

Describe how Open Education Resources (OER) **have been incorporated into the program's instructional materials. Identify other measures the institution will take to ensure course material affordability.**

Open educational resources will be used, when possible, to support courses that are a part of the curriculum. These OERs will support courses that cover specific content in sustainability.

25. What, if any, special preparation will students need for admission to the program? This may include pre-requisite courses or degrees, program-specific selective admission criteria or eligibility, or work experience

Applicants for admission to the MS Degree in Sustainability program must:

1. Submit a completed application for graduate admission.
2. Hold a bachelor's degree from a regionally accredited college or university.
3. Submit a current resume.
4. Have three letters of recommendation from individuals who are familiar with the applicant's scholarly performance, research ability, and personal motivation.
5. Submit official transcripts of credit from each university/college attended displaying a minimum of 2.75 cumulative Grade Point Average on a 4.0 scale.
6. International students from a non-English speaking country must also provide an affidavit of support, transcript evaluation, and TOEFL =79 or IELTS (IBT) =6.0. (International applicants must submit official transcripts to World Education Services (WES) for a course-by-course evaluation).

Required Program Pre-requisites:

All Concentrations:
Students planning to enroll in the MS Degree program in Sustainability will need to have completed a STEM degree. Those who have not earned a STEM degree will need to have completed at a minimum, one semester of General Biology, a minimum of one semester of General Chemistry and completed at least Calculus I.

For Concentrations related to alternative energy sources and green buildings:
Students who are planning to enter these two concentrations will be required to have completed an undergraduate degree program with the academic technical foundation in Engineering Technology or Engineering related disciplines to matriculate through the program.

Exceptions may be made for those students who can demonstrate relevant professional experience or coursework that is related to the concentration area they are seeking to enroll or they may be required to complete required undergraduate course as prerequisites to that concentration.

26. Identify the partners you are working with to create an educational and career pipeline for this program. Mark all that apply.

[ ] High school CTAE
[ ] High school STEM
[ ] Career academies
[ ] 2-year college
[ ] 4-year college/university
[ ] Employers
[ ] Community organizations
[ ] Professional associations
[X] Other Programs at your Institution
[X] Other Partner

List specific partners for each category checked above.

Other Partners

- U.S. Environmental Protection Agency (Region 6)
- LUMCON Louisiana Universities Marine Consortium

Other Programs at your Institution: Public Administration, Biology, Chemistry, Engineering Technology, Mathematics & Physics

27. Describe how the education pipeline for the program will function. Include any stackable or transferrable credentialing that is involved.

The program will employ a pipeline to recruit students. Adults who have a desire to change careers will be targeted. These adults may have earned a bachelor's degree or may have completed some type of graduate-level coursework. Various methods utilized to recruit students will include the following.

Online Platforms: Social media, professional networking sites, and online forums will be utilized to reach adults who are actively seeking to transition into a new career in sustainability. Creating targeted advertisements and engaging with relevant online communities will help generate interest and attract potential students.

Career Fairs: The program will participate in career fairs and events that specifically cater to adults looking for career changes or to further their education. These events will provide an opportunity to directly engage with individuals who may be interested in the sustainability program.

Alumni Networks: Leverage existing alumni networks to connect with individuals who have already completed their bachelor's degree or graduate-level coursework. Engaging with various alumni associations and utilizing their networks can help to identify potential candidates who may be interested in pursuing further education in sustainability.

University Partnerships: Collaborate with other programs at the university to identify senior-level students who have a desire to further their education in the field of sustainability. This can involve offering informational sessions to interested students.
By utilizing these recruitment strategies and by targeting specific groups of individuals, the sustainability program will establish a pipeline of students who are both motivated and interested in enrolling in and completing the program.

Stackable Credentials: The curriculum of the program will include stackable credentials. The credentials that will be infused into specific courses in the program include:

Getting Started with Enterprise Data Science (IBM Course)
Getting Started with Threat Intelligence and Hunting (IBM Course)

Sustainability Excellence Associate (SEA) credential
Leadership in Energy and Environmental Design (LEED) certification

28. Describe how the institution will support graduates in meeting career goals such as securing employment, further education, and industry certification.

The institution is committed and focused on providing resources to graduates that support achieving career goals. The following services will be available to students.

Career Services: Grambling State University's Center for Career and Professional Development (CCPD) offers a range of resources and services to assist students in securing employment. Services offered include job search support, resume and cover letter writing assistance, interview preparation, and networking opportunities. The CCPD hosts job fairs that serve the needs of both undergraduate and graduate students. Companies that are seeking to fill sustainability jobs to be a part of Job Fairs.

Alumni Network: Grambling State University has a strong alumni base. Students in the proposed program will be able to network with alumni and receive career guidance that could be beneficial in securing employment or exploring further educational opportunities.

Industry Partnerships: The institution fosters strong relationships with industry partners and professionals in the field of sustainability. These partnerships can lead to internship and job placement opportunities for students. Industry professionals will provide guest lectures, workshops, and mentorship to students that will assist in the development of skills. Students that elect the non-thesis option must enroll in the course, SU 699L, Professional Internship, and complete the internship in a Sustainability area. The internship could serve as a pathway for future career opportunities.

Further Education Support: Graduates interested in pursuing further education will receive guidance. This support will include assistance with researching and selecting relevant programs, preparing for admissions exams, and navigating the financial aspects of graduate education.

Professional Development Opportunities: The institution will offer professional development opportunities for students to enhance their skills and knowledge in sustainability. These opportunities may include workshops, seminars, and conferences.

Industry Certification Support: Grambling State University recognizes the importance of industry certifications in the field of sustainability. The program will provide resources and guidance to graduates who wish to pursue industry certifications relevant to their career goals. This support may include financial assistance and exam preparation resources.

By providing a comprehensive range of services graduates from the proposed program will be prepared to achieve career goals.

29. Describe how the success of program graduates will be tracked and assessed? Success may include employment, enrollment in another degree program, or certification/licensure passage.

The success of program graduates will be tracked and assessed through a comprehensive approach. Two weeks prior to completing the degree, a survey will be administered to graduates to collect updated contact information, employment information and information related to pursuit of a degree at an advanced level. The survey will also capture at what level the student believes he/she has demonstrated competency for each student learning outcome.

The institution will track and assess the success of program graduates at regular intervals (6 months, 1 year, 3 years, and 5 years after earning the degree) utilizing the following methods:

Follow-up Communication: Using email and social media platforms graduates will be administered a survey. The survey will obtain updated information on career progression and professional development activities. It will also support graduates providing input on their perception of how well the program prepared them for success. Graduates will be able to provide recommendations on how the program could be improved.

Follow-up Phone Calls: In addition to the survey, follow-up phone calls will be used to engage graduates from the proposed program. These phone calls will provide an opportunity to gather more detailed information, have in-depth conversations, and gain qualitative insights into graduates' experiences, challenges, and achievements.

Collaboration with Industry Partners: The institution may collaborate with industry partners to collect information on the employment and professional development activities of program graduates. This collaboration will provide a broader perspective on the success of graduates within the industry.

By implementing a comprehensive assessment plan the program will be able to receive valuable input from program graduates. Data collected will be analyzed and used to evaluate the effectiveness of the program and identify areas for improvement. This will ensure that students in the program receive the support needed to achieve career goals.

E. Students

30. Describe the institution's process for determining prospective and current student interest in the program. This may include enrollment in existing courses, minors, or concentrations, student surveys, admissions inquiries.

To determine prospective and current student interest in the proposed program, a sustainability program interest survey was conducted. The survey was distributed to both STEM and non-STEM students at GSU. The survey provided students with an overview of the proposed program and highlighted its interdisciplinary nature. One of the key questions asked was if a Master of Science program in Sustainability was needed. A total of 413 students, including 5 alumni, participated in the survey. More than 77% of those surveyed expressed an interest in the proposed program.

31. Provide current institutional and department/college overall retention and graduation rates.

During the Fall 2022 semester, a total of 38 first-time graduate students entered the university during that semester (Note: Nursing and Social Work are excluded from this number since their cohorts begin the program during the summer). Of this number, a total of 23 students returned during the Fall 2023 semester. The 1st to 2nd year retention rate for Fall 2022 to Fall 2023 for graduate programs in which the cohort begins the program during the fall semester is 61%. The 3-year graduation rate for full-time master level students is 49.37%.

It's important to note that these retention rates are specific to the overall graduate student population at the institution and not specifically for the proposed M.S. degree program in Sustainability. Since there is currently no graduate level STEM program at the university a direct comparison and correlation with the proposed program is not possible.

Retention and graduation rate data for graduate programs offered at the university is provided in the appendix.

32. Provide an enrollment projection for the next four academic years.

	Year 1	Year 2	Year 3	Year 4
Academic Year (Summer, Fall, Spring)	2026-27	2027-28	2028-29	2029-30
Base enrollment*		30	31	26
Lost to Attrition (should be negative)	0	-1	-2	-3
New to the institution	25	5	5	15
Shifted from existing programs within your institution	5	2	2	2
Total Enrollment	30	36	36	40
Graduates	0	5	10	5
Carry forward base enrollment for next year	0	31	26	35

*Total enrollment becomes the base enrollment for the following year

33. If projected retention and graduation rates are significantly different than for the institution overall, please explain.

Currently, no graduate level STEM program is offered at the institution to use for development of a graduation rate projection for the proposed program.

34. 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.

The marketing and recruitment plan for the program includes several strategies to reach adult learners and underrepresented populations. To market the program to adult learners, *Program Interest Fairs* will be held. These *Fairs* will provide an opportunity for adult learners to learn about the program and express their interest.

To attract underrepresented populations, a digital and social media campaign will be initiated. Program information will be posted on social media platforms such as Facebook, Instagram, and LinkedIn, targeting specific demographics that are underrepresented in higher education. This will help raise awareness and generate interest among these populations.

In addition, emails will be sent to every 4-year institution in Louisiana, as well as institutions outside of the state. This broad outreach will ensure that the program reaches a wide range of students, including those who may be interested in pursuing higher education outside of their home state.

F. RESOURCES

F1. Finance

35. Attach the completed Regents budget template

The completed budget template is provided in Appendix C.

The program budgeted approximately $65,000 per faculty member (that is $130,000 per year). This salary is not based on an overall average of Assistant Professor salaries at GSU but is aligned with the average salaries of other faculty at the institution. It is inaccurate to base salary solely on the overall averages of faculty at the institution because it does not consider the significant variations across academic disciplines, such as Business and Computer Science which are high-demand, high-salary fields, thus misrepresenting salaries in other areas. For example, the approximate nine-month salaries for Assistant Professors in Biology and Engineering Technology are $56, 100 and $62,061, respectively. Furthermore, to ensure efficient day-to-day management of the program a part-time Administrative Support Specialist will be hired to provide necessary support.

Title III funds will be allocated for the MS in Sustainability degree program, once approved. Over a five-year period, the program will be expected to receive Title III support that is approximately $1,000,000 (~$200,000 each year). By year three, Faculty supporting the program should have begun to receive grant funding ($100,000 each year).

36. How has student affordability been considered in the design of the program? Are there any additional financial costs that students will have to take on as part of this program? (e.g. special fees, software licenses, equipment, travel, etc.) If so, what strategies have you adopted to offset the cost burden?

Student affordability has been a key consideration in the design of the proposed program. The availability of a Sustainability Technology Lab for students to utilize computers equipped with appropriate software will assist in alleviating the financial burden on students.

The cost of textbooks can be a significant burden on students, and as a result, strategies were implemented in the design of the program. Open Educational Resources (OER) will be used as textbooks as often as possible. By incorporating OER books into the program, the financial burden on students will be reduced by utilizing free high-quality learning materials.

External grant funding will be sought to provide fellowships/assistantships for enrolled students. The acquisition of these funds will reduce the need for students to seek loans or part time jobs.

The university's Title III funds will be leveraged to support student travel to scientific conferences and other events. It is possible that these funds will also be used to partially support costs associated with the certifications identified in this program.

37. How will the institution cover increased indirect costs associated with the proposed program? Consider costs such as student advising, student support services, tutoring, career services, additional library materials, and replacing or upgrading technology or other infrastructure.

To cover the increased indirect costs associated with the proposed program, Grambling State University will seek additional funding through various means, including the three captured below.

Grant Funding: Program faculty will actively pursue grant opportunities. There are numerous grants available at the federal, state, and private levels that focus on expanding educational opportunities, promoting sustainability, and supporting student success. These grants will be leveraged to support various needs of the program.

External Partnerships and Donations: Grambling State University will establish partnerships with external organizations, businesses, and philanthropic foundations that have an interest in sustainability and environmental initiatives. The desire is these partnerships will provide financial support to assist in addressing indirect costs associated with the program.

Title III Funding: Grambling State University will secure funding through the Title III program, which provides federal support to Historically Black Colleges and Universities (HBCUs) for the development and improvement of academic programs, infrastructure, and student support services. Title III funds will be used to enhance student advising, support services, tutoring, career services, library resources, and technology infrastructure.

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

Existing funds will not be reallocated from existing programs.

F2. Instruction and Student Support

39. Faculty

a. Describe the needs for new/additional faculty for the program including program leadership? Identify any anticipated challenges in hiring adequate faculty, for the program.

The proposed program in sustainability will require additional faculty to ensure successful implementation and delivery. A *program coordinator* will be hired to provide guidance and oversight for the MS degree in Sustainability. This individual will be responsible for coordinating and managing the program. The program coordinator will play a crucial role in curriculum development, student advising, and program administration.

As the program grows new faculty will be hired. Anticipated challenges in hiring adequate faculty include the availability of qualified candidates and the competition that exist among institutions for related talent.

One possible strategy to overcome challenges in hiring adequate faculty will involve expanding the overall recruitment efforts to reach a wider pool of qualified candidates. This will include actively seeking potential candidates from diverse backgrounds and utilizing various platforms, such as online job boards and professional networks, to increase visibility and attract top talent. Another strategy to address the challenges in hiring adequate faculty will involve establishing partnerships with educational institutions, both locally and globally, to tap into their talent pool and create a pipeline of potential faculty members. This collaboration will include joint research projects, exchange programs, and faculty development initiatives to foster a mutually beneficial relationship. This will give us the ability to stand out among other institutions and to attract highly qualified candidates.

By adopting a proactive and inclusive approach to recruitment, fostering partnerships, and offering attractive incentives, we will be able to overcome potential challenges associated with hiring adequate faculty.

How will current faculty be re-directed to this program from existing programs?

Faculty from current programs offered in Biology, Engineering Technology, Mathematics & Physics, and Public Administration, will be redirected to the proposed program through a few strategies. An approach that will be used is to free up faculty in these areas from teaching general education courses and allow them to focus on teaching courses in the proposed program. Adjunct faculty will be leveraged to teach the general education courses that these faculty are released from teaching. By relieving faculty from teaching lower-level courses, they will have more time to dedicate to the teaching of advanced courses in the proposed graduate program.

Faculty supporting Green Buildings and Alternative Energy Sources: There are six faculty members with educational backgrounds and industrial work experience who can serve as instructors for these concentrations. Faculty knowledge related to green building and sustainable energy areas are enhanced by industrial work experiences, Grambling entered into a Memorandum of Understanding with the U.S. Environmental Protection Agency in which the focus was on preparing students to enter and compete in the federal workforce, providing expertise to review and enhance curriculums, and participate in researching efforts to promote environmental awareness. Two faculty developed learning modules that were infused into courses offered in the department. The learning activities were on issues related to air quality, LEED, and clean/renewable energy.

b. Attach your SACSCOC Faculty Roster for the proposed program. (Please indicate anticipated positions that will need to be filled in the future).

The SACSCOC Faculty Roster is found in Appendix D

40. Describe additional staff needed for this program (e.g. advising, professional development, program administration, academic coaching, etc.).

A program coordinator will be hired to provide guidance and oversight for the MS degree in Sustainability. This individual will be responsible for coordinating and managing the program, addressing any concerns

related to the graduate program, and ensuring its overall success. The program coordinator will play a crucial role in curriculum development, student advising, and program administration.

The Master of Science in Sustainability program will be administratively situated within the Department of Biological Sciences. The Department Chair will assume the role of Program Director for the program's initial operational phase, facilitating its establishment and development. Subsequent to the program's stabilization, a permanent leadership structure will be determined. All faculty appointments specific to the MS in Sustainability program will be evaluated and granted tenure within the Department of Biological Sciences or Engineering Technology, depending on the concentrations they support. This administrative framework is designed to ensure the program's effective launch and integration within the existing academic structure.

To maintain graduate faculty status, faculty teaching in this program will be required to consistently engage in scholarly activities.

F3. Facilities

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

[X] Main Campus [ ] Satellite campus (specify campus here) [X] Other (Hybrid) [ ]100% Online

42. What types of facilities are needed for the program? Fill out the chart below as applicable. Add lines under "other" as needed.

Space	New Space	Use Existing Space (as is)	Use Existing Space (Renovated)	Sem/Yr. of Occupancy
Dry Labs (STEM related)		X		
Wet Labs (STEM related)		X		
Dedicated Offices				
Fine Arts Spaces				
Classrooms				
Meeting Rooms		X		
Student Study Space		X		
Shared Space with other campus units				
Other (Specify)		Computer Lab		

43. Describe needs and costs for new or renovated facilities required for the program. 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: mechanical/electrical/plumbing, site utilizes, parking/drainage, IT networks, resiliency infrastructure, etc.

44. 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

45. 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 existing program will be negatively impacted.

46. 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 and Equipment

47. Identify any major equipment or technology integral to program implementation and sustainability. List equipment or assets over $5,000 (cumulative per asset) needed to start-up and run the program.

Technology and Equipment	Start-up Costs	On-going Costs	Est. Start Date of Operations/Use
N/A			
Total Technology and Equipment Costs	**0**	**0**	

G. RISKS AND ASSUMPTIONS

48. In the table below, list any risks to the program's implementation over the next four years. For each risk, identify the impact (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	Impact	Probability	Risk Mitigation Strategy
Recruitment of new faculty	Low	Low	The program will expand the pool of applicants by widening the demographic area targeted. In addition to hiring full time faculty, the program will utilize Sustainability Professionals working in the field as part-time faculty.
Recruitment of Students	Low	Low	Implementation of a comprehensive marketing and recruitment plan.
Retention & Graduation of Students	Low	Low	Delivery of Program using a hybrid model.

Appendix A: Letters of Support

GRAMBLING
STATE UNIVERSITY
GRAMBLING, LOUISIANA

College of Arts and Sciences

March 12, 2025

Re. Letter of Commitment for Grambling State University's Master of Science in Sustainability

The imperative of sustainability is increasingly evident in the national landscape. Cultivating a highly trained and skilled workforce is paramount to ensure the readiness of the State of Louisiana and the nation for the challenges and opportunities of the future.
The rapid evolution of global dynamics necessitates the implementation of sustainable practices to enhance societal well-being and ensure the long-term viability of our communities.

Grambling State University (GSU) recognizes the critical importance of fortifying its science programs. Rigorous curricula and enriched learning experiences are essential components in the comprehensive preparation of our students. This program is poised to complement existing institutional efforts by seamlessly integrating science-related content and research opportunities into the graduate curriculum. Furthermore, this initiative will augment the research capabilities of GSU faculty through strategic collaborative endeavors.

Specifically, GSU has existing strengths within its Engineering Technology and Biological Sciences research areas, which will be leveraged to provide a robust foundation for the proposed program. The program will also foster interdisciplinary collaboration across departments to ensure a holistic approach to sustainability education.

The College of Arts and Sciences is confident that this program will contribute significantly to the advancement of sustainability education and research, and we pledge our full support for its successful implementation.

Sincerely,

Dr. Stacey Duhon, Ph.D.

Dean,

College of Arts and Sciences

GSU Box 4260 403 Main Street Grambling, LA 71245 Office: 318.274.4006 Fax: 318.274.6041 www.gram.edu

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research that contributes to their thesis/dissertation. Students participating in the proposed M.S. program will fit well within these existing education programs.

The overall mission of the LUMCON's education and outreach program is to enable the next generation of marine scientists and ocean literate citizens. LUMCON achieves this goal by providing meaningful and relevant place-based and skill-based experiences for all visitors, while aiming to have significant impacts on Louisiana's diverse citizenry including those populations underrepresented and underserved in marine science. LUMCON has a long legacy and expertise in place-based education programs that cultivates and defines the roles of students as creators of solutions to the issues that face Louisiana through hands-on STEM-readiness training. The program targets audiences from "pre-K to gray" with activities offered for K-12 and teacher, university, and general public levels to provide each audience with field experiences and information about marine and coastal environments. Specifically, LUMCON 1) concentrates on skill- and location-based programs; 2) reaches students and schools lacking the resources to visit the DeFelice Marine Center in Cocodrie (or new Houma Maritime Campus); 3) provides the training and opportunities that inspire the next generation of marine scientists and lead them to successful careers; 4) creates opportunities for underrepresented and underserved groups in marine science; 5) elevates emerging and young scientists through thoughtful and lasting mentorship; 6) delivers unique, innovative skill and location based undergraduate/graduate courses.

I see this proposed M.S. program in Environmental Sustainability as a tremendous opportunity for Grambling and LUMCON to expand our collaborations in ways that will benefit both institutions and provide needed opportunities to new cohorts of students. LUMCON has the facilities, education and outreach staff, and in residence faculty needed to facilitate rewarding research experiences for students enrolled in the proposed M.S. program. Our faculty have experience mentoring students from throughout the consortium through our adjunct faculty affiliations at different member institutions. Additionally, all of our faculty have participated as mentors in our REU program and most have mentored in our STEM Prep program. Additionally, we have run an internship program with Louisiana Tech for several years (before COVID disruptions) in which LA Tech undergraduate students are co-mentored by a LA Tech and a LUMCON faculty member on research projects that begin with a three-week residency in Cocodrie and continue through the following quarter back at the LA Tech campus. Elements of this approach might be adapted into the new M.S. program in Environmental Sustainability.

I think the proposed new M.S. program in Environmental Sustainability at Grambling State University is an exciting opportunity for Grambling as well as the overall consortium. LUMCON is happy to work with Grambling staff to support this new program in any way that we can. Please feel free to reach out to me if I can be of any assistance in the development of this exciting program. Best of luck moving forward.

Sincerely,

Brian J. Roberts

Brian J. Roberts
Executive Director and Chief Scientist
Ecosystem Ecology and Biogeochemistry Lab | REU Program Director
Louisiana Universities Marine Consortium | 8124 Highway 56 | Chauvin, LA 70344
985-851-2801, -2821, broberts@lumcon.edu

LOUISIANA HOUSE OF REPRESENTATIVES

200 Advocate Row, Suite D
Vidalia, LA 71373
Email: hse021@legis.la.gov
Phone: 225.308.4269
Fax: 318.336.9268

Agriculture, Forestry, Aquaculture, and Rural Development, Health and Welfare, Transportation, Highways, and Public Works, House Select Committee on Homeland Security

C. Travis Johnson
State Representative ~ District 21

March 27, 2025

Re: Grambling State University Master of Science in Sustainability

Dear Sir/Madam:

Sustainability is the future of our nation and having a trained and skilled workforce is paramount in order to ensure that the great state of Louisiana, and our nation, are ready for that future. The world is changing rapidly, and sustainable endeavors are pertinent in order to make our world better and be able to endure the needs of our population. From Industrial Hemp, to Solar Power, to Hydroelectricity, to electric cars, these are just some of the future countless sustainable areas where many of our federal agencies are demanding that we move towards.

The future started yesterday, and we need to catch up. We must move rapidly to prepare our world for what is here now and what is ahead. Sustainability is being demanded by the United Nations and our Federal Government. I wholeheartedly support Grambling State University's efforts to create a Master of Science in Sustainability as an interdisciplinary graduate program that will be open to all majors. Students will need to understand the importance of government in the implementation of sustainability related policies, and I feel this program will provide this and so much more. This program will put Grambling State University students at the table of innovation.

When the Delta Agriculture Research & Sustainability District was created, the goal was to work with universities such as Grambling State University to help move our state into the future. Grambling State University is headed in the right direction and can be a trailblazer in this area. I see these future graduate students conducting innovative research, working on existing sustainable projects, and using their creativity to work with state and local leaders to bring government, university research, and the private sector together to enhance the mission of Delta Agriculture Research & Sustainability District.

Advancement in sustainability, and strategic placement of training and resources can be life changing for the state of Louisiana. This graduate program can realistically, not figuratively, change the trajectory of our rural state. I urge you to support Grambling State University and their efforts to not only develop this program, but to be successful in it. If there is any further information needed regarding this matter, please do not hesitate to reach out.

Sincerely,

C. Travis Johnson
State Representatives/District 21

Dear Dr. Hill,

I am writing to enthusiastically recommend the establishment of a Master of Science in Sustainability program at Grambling State University, with the full support of The Paragon Universe. The proposed curriculum, with its comprehensive core courses and diverse tracks, is an exceptional initiative that aligns with the current needs and demands of our society. This program will undoubtedly prepare students to address critical challenges in sustainability, making it a valuable addition to our educational offerings.

Rationale for Recommendation

The field of sustainability has grown significantly in recent years, and it is now imperative to equip students with the knowledge and skills to tackle complex environmental and social issues. The proposed program's structure, offering three tracks and thesis/non-thesis options, allows students to tailor their education to their specific interests and career goals. The inclusion of professional internships within the non-thesis track is particularly commendable, as it bridges the gap between academic learning and practical experience, preparing students for careers in the field of sustainability.

Certifications and Career Competencies

The incorporation of certifications within each track demonstrates a forward-thinking approach to education. These certifications will enhance students' career prospects and demonstrate their expertise to potential employers. Furthermore, the alignment of the program with career competencies in the sustainability field ensures that graduates will be well-prepared to make a meaningful impact in their careers.

Thesis and Non-Thesis Options

The flexibility of offering both thesis and non-thesis options caters to a wide range of students with diverse aspirations. The thesis option encourages in-depth research and critical thinking, while the non-

thesis option, complemented by the Professional Internship Experience, provides a more practical and hands-on approach. This approach recognizes that success in the field of sustainability requires a combination of theoretical knowledge and practical skills.

Elective Courses

The inclusion of elective courses, such as "Climate Change and Society" and "GIS for Sustainability Development," further enhances the program's versatility. These courses address contemporary challenges and provide students with a holistic understanding of sustainability issues.

Impact and Innovation

The Master of Science in Sustainability program not only meets the current demand for sustainability professionals but also prepares students to drive innovation and lead transformative change in various sectors. The comprehensive curriculum, professional internships, and elective courses will empower students to address real-world sustainability challenges with confidence and creativity.

Letter of Support

The Paragon Universe is fully committed to supporting the initiatives for sustainability, as we believe they are well-positioned to drive change. With our expertise in energy, transportation, and infrastructure, we are eager to support the program by offering internships and valuable insights from our industry. We are excited about the potential impact this program will have on the future of sustainability, and we wholeheartedly endorse its establishment at Grambling State University.

Sincerely,

D. Thanos Smith
Chief Visionary Officer
The Paragon Universe
www.paragonvtol.com

Appendix B: Question 22 and Curriculum Maps

Question # 22

Attach a map of the curriculum by semester for a full-time student enrolled in at least 15 units per semester. This may be structured like a program of study in the general catalog or on a curriculum guide.

- Include course prefixes, numbers, titles, and credit hour requirements. Identify courses that meet general education requirements.
- Include alternate tracks and requirements by concentration if applicable. Identify courses that are applicable to the alternative tracks.
- List all major course requirements. Indicate the word "new" beside new courses.
- Indicate work-based learning experiences (such as internships, clinicals etc.) if applicable.
- Provide a summary of how the curriculum meets the learning outcome goals described in questions 18-21.

Curriculum

The program will produce graduates with skills that support being able to accomplish the following.

- Apply system thinking skills to analyze problems and develop solutions in ways that address root causes, connections, and preventative measures.
- Formulate approaches to reduce the negative effects on human and environmental wellbeing, while ensuring fairness and environmental justice are upheld.
- Develop strategies that support sustainable communities.
- Use data analytics to sort and analyze large amounts of data to make informed decisions.
- Develop policies.

Four (4) student learning outcomes have been identified for the program. The curriculum supports students achieving each of the following learning outcomes.

SLO 1: Apply critical and analytical thinking skills to evaluate complex sustainability challenges and propose effective solutions.

SLO 2: Examine and investigate the implications for human- and ecological well-being, including equity, and environmental justice.

SLO 3: Select and utilize appropriate technologies to assess, prevent, and remediate environmental challenges.

SLO 4: Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.

The curriculum for each of the three concentrations (Concentration 1-Renewable and Sustainable Energy, Concentration 2-Water and Air Quality, and Concentration 3-Sustainable Green Buildings) that will be offered are aligned with the learning outcomes that have been identified for the proposed program. The curriculum map for each concentration is provided in this appendix and captures the alignment of each course with one or more of the student learning outcomes. Courses will incorporate relevant content and activities to enable students to earn specific sustainability certifications. These certifications will further enhance their expertise in the field of sustainability. To assess students' progress and competency in achieving the program's learning outcomes, various evaluation methods will be utilized. These include assignments, exams, case studies, projects, non-thesis internship, 50-page paper, thesis, and written reports. Rubrics aligned with specific outcomes will be used to assess students' work.

The MS in Sustainability program will offer both a thesis and non-thesis option. The thesis option involves six credits of thesis research, while the non-thesis option requires six credits of additional coursework. Students electing the non-thesis option will engage in a work-based learning experience as a part of their enrollment in ***SU 699L- Professional Internship Experience***. The non-thesis option provides opportunities for students to apply their knowledge and skills in real-world settings.

Master of Science in Sustainability Program Curriculum

REQUIRED CORE COURSES	**CREDIT HOURS**
PA 500 Principles-Public Administration	3
PA 512 Policy Formation/Implementation and Evaluation	3
SU 501 Introduction to Sustainability	3
SU 502 Fundamentals of Ecology for Sustainable Ecosystems	3
SU 503 Environmental Quality and Toxicology	3
SU 601 Data Analytics & Statistical Analysis	3
SU 602 Data Visualization	3

21 cr. hrs.

- **Thesis Option**

Concentration courses	**12 credit hours**
SU 698 MS Thesis Research I – Sustainability	3
SU 699 MS Thesis Research II – Sustainability	3

Total Credit Hours = 21 Core hrs + 6 hrs Thesis Research + Concentration required courses -12 cr. hrs.) = **39 credit hours**

- **NON-THESIS Option**

***Concentration courses**	**12 credit hours**
SU 699L Professional Internship Experience	**6 credit hours**

The purpose of the SU 699L Professional Internship Experience is to provide students with the opportunity to work in a professional setting that will allow the student the ability to develop and demonstrate skills in the field of sustainability. The professional internship experience will serve as a pathway for future career opportunities in the area of sustainability. Internship participants will integrate the theories and practices learned in and out of the classroom while also enhancing their professional skills in a work-related environment. The Professional Internship Experience is a full semester long experience. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. develop strategies that support sustainable communities, use data analytics to sort and analyze large amounts of data to make informed decisions and formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

Total Credit Hours = 21 Core credit hours+ concentration required courses -12 credit hours + Professional Internship-6 credit hours = 39 credit hours.

Curriculum for Renewable and Sustainable Energy Concentration

Course No.	Course Title	HR	Sem. Yr	SLO
YEAR 1				
FALL				
PA 500	Principles-Public Administration	3		2,4
SU 501	Introduction to Sustainability	3		1,3
SPRING				
PA 512	Policy Formation/Implementation and Evaluation	3		1,2,4
SU 502	Fund. of Ecology for Sustainable Ecosystems	3		2 3
SUMMER				
SU 601	Data Analytics & Statistical Analysis	3		1,4
	TOTAL	**15**		
YEAR 2				
FALL				
SU 503	Environmental Quality and Toxicology	3		2 ,3
SU 602	Data Visualization	3		1,4
SPRING				

ET 603	Sustainable and Renewable Energy Concepts	3		1,3,4
ET 604	Photovoltaic Energy Systems	3		1,3,4
SUMMER				
ET 605	Power System Analysis	3		1,3,4
	TOTAL	**15**		
YEAR 3				
FALL				
ET 606	Grid Design and Operation	3		1,3,4
SU 698	MS Thesis Research I – Sustainability *(THESIS ONLY)*	3		
SPRING				
SU 699L	Professional Internship Experience *(NON-THESIS ONLY)*	6		
SU 699	MS Thesis Research II – Sustainability *(THESIS ONLY)*	3		
	TOTAL	9		

REQUIRED Concentration Courses

ET 603 Sustainable and Renewable Energy Concepts (3 credit hours)
ET 604 Photovoltaic Energy Systems (3 credit hours)
ET 605 Power System Analysis (3 credit hours)
ET 606 Grid Design and Operation (3 credit hours)

COURSE ALIGNMENT WITH PROGRAM OBJECTIVES AND STUDENT LEARNING OUTCOMES- FOR *RENEWABLE & SUSTAINABLE ENERGY CONCENTRATION*

Concentration 1: Course #	**Course Name**	**Program Objective**	**SLO**
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	2, 3
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring	1, 2, 3

		fairness and environmental justice are upheld Develop strategies that support sustainable communities	
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
ET 603	Sustainable and Renewable Energy Concepts	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 4
ET 604	Photovoltaic Energy Systems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1,3,4
ET 605	Power System Analysis	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 3,4
ET 606	Grid Design and Operation	Analyze problems and develop sustainable solutions in ways that address	1,3,4

		root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 2, 3, 4

		Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.	
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

Curriculum for Concentration in Water and Air Quality

Course No.	Course Title	HR	Sem. Yr	SLO
YEAR 1				
FALL				
PA 500	Principles-Public Administration	3		2,4
SU 501	Introduction to Sustainability	3		1,3
SPRING				
PA 512	Policy Formation/Implementation and Evaluation	3		1,2,4
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	3		2 ,3
SUMMER				
SU 601	Data Analytics & Statistical Analysis	3		1,4
	TOTAL	**15**		
YEAR 2				
FALL				
SU 503	Environmental Quality and Toxicology	3		2,3
SU 602	Data Visualization	3		1,4
SPRING				
SU 607	Sustainable Waste Management	4		2,3
SU 608	Advanced Water Quality Management	4		1,2,3
SUMMER				
SU 609	Air Quality Assessment and Management	4		1,2,3
	TOTAL	**18**		
YEAR 3				
FALL				
SU 698	MS Thesis Research I – Sustainability ***(THESIS ONLY)***	3		1,2,3,4
SU 699L	Professional Internship Experience ***(NON-THESIS ONLY)***	6		1,2,3,4

SPRING				
SU 699	MS Thesis Research II – Sustainability ***(THESIS ONLY)***	3		
	TOTAL	6		

REQUIRED CONCENTRATION COURSES

SU 607 Sustainable Waste Management (4 credit hours)
SU 608 Advanced Water Quality Management (4 credit hours)
SU 609 Air Quality Assessment and Management (4 credit hours)

COURSE ALIGNMENT WITH PROGRAM OBJECTIVES AND STUDENT LEARNING OUTCOMES- FOR *WATER & AIR QUALITY CONCENTRATION*

Concentration 2: Course #	**Course Name**	**Program Objective**	**SLO**
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld	2, 3

		Develop strategies that support sustainable communities	
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 607	Sustainable Waste Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 608	Advanced Water Quality Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 609	Air Quality Assessment and Management	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures.	1, 2. 3

		Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

		Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.	
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

Curriculum for Concentration in Green Buildings

Course No.	Course Title	HR	Sem. Yr	SLO
YEAR 1				
FALL				
PA 500	Principles-Public Administration	3		2,4
SU 501	Introduction to Sustainability	3		1,3
SPRING				
PA 512	Policy Formation/Implementation and Evaluation	3		1, 2,4
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	3		2,3
SUMMER				
SU 601	Data Analytics & Statistical Analysis	3		1,4
	TOTAL	**15**		
YEAR 2				
FALL				
SU 503	Environmental Quality and Toxicology	3		,2,3
SU 602	Data Visualization	3		1,4
SPRING				
ET 610	An Overview of Sustainable Building Technology	3		1,3,4
ET 611	Principles of Green Buildings	3		1,3,4
SUMMER				
ET 612	Sustainable Materials Methods, and Equipment	3		1,3,4
	TOTAL	**15**		
YEAR 3				
FALL				
ET 613	Energy-Efficient Building Design	3		1,3,4
SU 698	MS Thesis Research I – Sustainability ***(THESIS ONLY)***	3		
SPRING				
SU 699L	Professional Internship Experience	6		

	(NON-THESIS ONLY)			
SU 699	MS Thesis Research II – Sustainability *(THESIS ONLY)*	3		
	TOTAL	9		

Concentration Courses

ET 610 An Overview of Sustainable Building Technology (3 credit hours)

ET 611 Principles of Green Buildings (3 credit hours)

ET 612 Sustainable Materials Methods, and Equipment (3 credit hours)

ET 613 Energy Efficient Building Design (3 credit hours)

COURSE ALIGNMENT WITH PROGRAM OBJECTIVES AND STUDENT LEARNING OUTCOMES- FOR *GREEN BUILDINGS*

Concentration 3: Course #	**Course Name**	**Program Objective**	**SLO**
PA 500	Principles-Public Administration	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	2, 4
PA 512	Policy Formation/Implementation and Evaluation	Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 4
SU 501	Introduction to Sustainability	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities.	1, 3
SU 502	Fundamentals of Ecology for Sustainable Ecosystems	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures.	2, 3

		Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	
SU 503	Environmental Quality and Toxicology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
SU 601	Data Analytics & Statistical Analysis	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
SU 602	Data Visualization	Use data analytics to sort and analyze large amounts of data to make informed decisions.	1, 4
ET 610	An Overview of Sustainable Building Technology	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3
ET 611	Principles of Green Buildings	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2, 3

ET 612	Sustainable Materials Methods, and Equipment	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1, 2. 3
ET 613	Energy Efficient Building Design	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld Develop strategies that support sustainable communities	1,3,4
SU 698	MS Thesis Research I – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2,3, 4
SU 699L	Professional Internship Experience **(NON-THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring	1, 2, 3, 4

		fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes Effectively communicate and collaborate with diverse stakeholders to plan, develop, and implement sustainable solutions.	
SU 699	MS Thesis Research II – Sustainability **(THESIS ONLY)**	Analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures. Formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. Develop strategies that support sustainable communities. Use data analytics to sort and analyze large amounts of data to make informed decisions. Formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes	1, 2, 3, 4

COURSE DESCRIPTIONS

Core Courses

PA 500 Principles of Public Administration **3 cr. hrs.**

This course examines the history and foundation of Public Administration. Beginning MPA students will engage in extensive studies of: the development and history of public administration, bureaucracies, organizational and administrative theories, and public policy decision-making. The course surveys the character and scope of public administration in the U.S. at the national, state, and local levels. This course will support the student in being able to formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

PA 512 Policy Formation/Implementation and Evaluation **3 cr. hrs**

This course is designed to understand and analyze the complexities involved in preparing public policy. In a complex modern society, public policy evolves, matures, and gets into action all the time. With limited resources and stake holders from diversified backgrounds, the public policy debates are always evolving – some get legislated, adopted and implemented, and of course get evaluated – and occasionally some get terminated. The challenges of public policy analyses are to make sure there are different ways at different times and may produce different effects. Since no one has all the facts and knowledge in her hand to predict with precision, and since time and context is ever changing, public policy process will always be an incomplete journey; however, that should not be a predicament to attempt for a prudent public policy. This course will support the student in being able to formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

(NEW) SU 501 Introduction to Sustainability **3cr. hrs.**

This course explores contemporary understandings and practical implications of the idea of sustainable development at the national and international levels. The course's focus will investigate the vast meanings of the term sustainability and its history, including major global initiatives. The interactions and interdependencies of ecology, social justice, and the economy are explored in a national and global context. The course also examines the underlying psychological and cultural facts that affect human-environmental interactions, e.g., environmental psychology, indigenous perspectives vs. anthropocentric thinking. Society practices to decrease the depletion of environmental resources are covered. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) SU 502 Fundamentals of Ecology for Sustainable Ecosystems 3cr. hrs.

This course addresses and examines the interrelationships between living organisms and a sustainable ecosystem. Emphasis is placed on both the physical and the biological components of the environment while also addressing ecological restoration, maintaining ecosystem services in agricultural and other human-dominated landscapes. Biogeochemical cycles, relations, population ecology, and the types of communities and ecosystems. Current issues, challenges and problems related to sustainability are also discussed. The foundation and future framework that is required for the deep appreciation and respect of sustainable ecosystems. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) SU 503 Environmental Quality and Toxicology Course 3cr. hrs.

This course delves into the applications of toxicology in the development of environmental regulations and policies by national and state agencies. It aims to equip students with knowledge on the use of toxicological evaluations in assessing monitoring data of the environment. By the end of the course, students will be able to make well-informed decisions based on a thorough understanding of toxicology and how it is used to influence environmental quality regulatory practices. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) SU 601 Data Analytics and Statistical Analysis 3cr. hrs.

The course provides a comprehensive knowledge of the concepts, techniques, applications, and open problems in Data Analytics and Statistical Analysis. The course has an emphasis on some techniques for supervised and unsupervised learning, statistical techniques, and geographic information systems. The focus of this course is to prepare students for using data to derive information, gain knowledge, and produce wisdom. In addition, it helps students to acquire knowledge on emerging Big Data Analytics technologies. This course will support the student in being able to use data analytics to sort and analyze large amounts of data to make informed decisions.

(NEW) SU 602 Data Visualization Course Description 3cr. hrs.

Data visualization is the process of communicating data through visual representations, such as charts, graphs, and maps. It is a powerful tool for communicating complex information in a clear and concise way, and it is essential for understanding and solving sustainability challenges.

This course will introduce students to the principles and practices of data visualization. Students will learn how to choose the right visualization for their data and audience, and how to create effective and engaging visuals. The course will also cover topics such as data storytelling, color theory, and perceptual psychology. They will also be exposed to common types of data visualizations, such as charts, graphs, and maps, and how to use data visualization software to create effective visualizations. Students will have the opportunity to apply what they learn to real-world sustainability problems. They will work on projects to visualize data on topics such as climate change, renewable energy, and sustainable agriculture. In addition to learning the technical skills related to data visualization, students will also discuss ethical considerations in this field. It is important to be aware of the potential for bias and misrepresentation in data visualizations, and to use these tools responsibly. This course will support the student in being able to use data analytics to sort and analyze large amounts of data to make informed decisions.

Thesis option

(NEW) SU 698 MS Thesis Research I – Sustainability **3cr. hrs.**

This course allows students to thoroughly investigate a research topic in Environmental Sustainability. This course will challenge students to identify a specific research problem and implement an appropriate research method culminating in the completion of an original research project. Graduate students work under the direction of a thesis research advisor. Enrollment is required of, and limited to, students pursuing the thesis option. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. develop strategies that support sustainable communities, use data analytics to sort and analyze large amounts of data to make informed decisions and formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes

(NEW) SU 699 MS Thesis Research II – Sustainability **3cr. hrs.**

This course is a continuation of SU 698. In this course students will finalize the thesis project and satisfactory performance during the thesis defense. Graduate students work under the direction of a thesis research advisor. SU 699 may be taken concurrently with SU 698 with permission from the department head. Enrollment is required of, and limited to, students pursuing the thesis option. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. develop strategies that support sustainable communities, use data analytics to sort and analyze large amounts of data to make informed decisions and formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

Non-Thesis option

(NEW) SU 699L Professional Internship Experience **6 cr. hrs.**

The purpose of the SU 699L Professional Internship Experience is to provide students with the opportunity to work in a professional setting that will allow the student the ability to develop and demonstrate skills in the field of sustainability. The professional internship experience will serve as a pathway for future career opportunities in the area of sustainability. Internship participants will integrate the theories and practices learned in and out of the classroom while also enhancing their professional skills in a work-related environment. The Professional Internship Experience is a full semester long experience. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld. develop strategies that support sustainable communities, use data analytics to sort and analyze large amounts of data to make informed decisions and formulate and evaluate effective policies that address specific needs and promote desired sustainable outcomes.

Concentration-RENEWABLE SUSTAINABLE ENERGY

(NEW) ET 603 Sustainable and Renewable Energy Concepts **3 cr. hrs.**

This course focuses on both the theory and practice of producing electrical *energy* from non-fossil fuel sources. It will also provide students with a solid foundation for understanding and utilizing current renewable energy technologies such as wind and solar. In addition, students will gain an understanding of energy storage technologies such as pumped hydro, batteries, and hydrogen. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 604 Photovoltaic Energy Systems **3 cr. hrs.**

An extensive review into solar photovoltaic (PV) power systems and their installation. This course will include PV topics including jobsite safety, solar energy fundamentals, electricity basics and its association with sustainable energy. After successful completion of the course the student will have basic knowledge of solar power systems, relevant electrical concepts and its contribution to sustainable energy. Photovoltaics for production of electricity from solar energy. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 605 Power System Analysis **3 cr. hrs.**

The course provides a thorough study of power system data, and the methods used in the analysis of power systems. The following types of studies are covered: short circuit, load flow, motor starting, cable ampacity, stability, harmonic analysis, switching transient, reliability, ground mat, protective coordination, power system modeling. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 606 Grid Design and Operation **3 cr. hrs.**

This is an advanced course which focuses on the principles, technologies, and practices involved in the planning, design, implementation, and operation of grid systems. It provides students with the knowledge and skills necessary to design, optimize, and manage grid projects for various applications, including commercial, industrial, residential, and remote communities. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

- **Concentration: WATER AND AIR QUALITY**

(NEW) SU 607 Sustainable Waste Management **4 cr. hrs.**

This course provides a comprehensive study of recycling and reusing waste that is produced and how it benefits and/or harms the environment. Techniques will be addressed that focus on keeping materials in use for as long as possible to minimize the amount of solid waste that enters landfill. Reduction of the use of incineration practices are discussed as air and water quality issues are addressed. Students will be led in case studies as the entire lifecycle from cradle to grave of various products are addressed. Topics may include producer liability, the circular economy, and social/environmental justice aspects of e-waste and toxic wastes. Reducing the negative environmental and social impacts of a product's overall consumption is discussed. This course has a laboratory component that works directly with the campus recycling program. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) SU 608 Advanced Water Quality Management **4 cr. hrs.**

This course relates directly to the by-laws of the Clean Water ACT (CWA) of 1972 and takes an advanced approach to the impact that chemical, physical and biological water parameters have on water systems. Regulatory water quality criteria and standards, limnological aspects of lakes and

reservoirs, and water quality related legislation are addressed as related to water quality management practices. Risk assessment methodologies are applied for deriving optimal decisions. This course has a laboratory component. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) SU 609 Air Quality Assessment and Management. 4cr. hrs.

This course is designed to provide general managers and environmental practitioners with knowledge of the discipline of air quality management. The scientific theory and the methods that are used to measure and model air quality for the purpose of managing the protection of the environment and the health of the public are addressed. This course has a laboratory component. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

- **Concentration: SUSTAINABLE GREEN BUILDINGS**

(NEW) ET 610 An Overview of Sustainable Building Technology 3 cr. hrs.

This course provides an understanding of the environmental impacts created by the building industry and the benefits of green building. The focus will include a variety of options in solar design, including daylighting, and technology for energy efficiency. Students will gain an understanding of the advantages and disadvantages of solar and wind renewable energy. It includes a look at the positive effects sustainable buildings have on people, community economy, and the world. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 611 Principles of Green Buildings 3 cr. hrs.

This course focuses on the evolution of green buildings and the concept of sustainability through the principles, practices, and components that distinguish sustainable buildings from traditional buildings. Emphasis on the strategies for the design of green buildings will also be discussed along

with their evolution over time. LEED (Leadership in Energy and Environmental Design) certification will also be integrated into the course. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 612 Sustainable Materials Methods, and Equipment 3 cr. hrs.

The focus of this course is to expose the students to the concepts of sustainability in the context of building and conventional engineered building materials, such as concrete, bricks, and achieving the same through lower carbon cements, superior brick kilns and recycled aggregate minimizing consumption of natural resources including water. Studies include construction materials, and their evolution, building systems and methods, construction equipment types and their usage. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

(NEW) ET 613 Energy Efficient Building Design 3 cr. hrs.

This course covers principles of energy efficient design buildings and how they reduce the environmental impacts in terms of energy, water, waste, and indoor environment. A primary focus of the course is to review the thermal and radiant behavior of buildings and understand climate data to explore the role light and energy play in the design of buildings to reduce carbon emissions. This course will support the student in being able to analyze problems and develop sustainable solutions in ways that address root causes, connections and preventative measures, formulate approaches to reduce the negative effects on human and environmental well-being, while ensuring fairness and environmental justice are upheld and develop strategies that support sustainable communities.

Appendix C: Budget

SUMMARY OF ESTIMATED ADDITIONAL COSTS/INCOME FOR PROPOSED PROGRAM

Institution: Grambling State University **Date:** March 31, 2025

Degree Program, Unit: M.S. in Sustainability

FTE = Full Time Equivalent (use the institution's standard definition and provide that definition).

EXPENDITURES								
INDICATE ACADEMIC YEAR:	**FIRST**		**SECOND**		**THIRD**		**FOURTH**	
	AMOUNT	**FTE**	**Amount**	**FTE**	**AMOUNT**	**FTE**	**AMOUNT**	**FTE**
Program Director (1)	-		$123,300	100	$123,300	100	$123,000	100
Faculty (2)	$89,050	100	$178,100	100	$178,100	100	$178,100	100
Graduate Assistants (4)	-		$43,200	100	$43,200	100	$43,200	100
Administrative Support Specialist	$27,400	50	$27,400	50	$27,400	50	$27,400	50
Fellowships and Scholarships (5)	$25,000	100	$25,000	100	$25,000	100	$25,000	100
SUB-TOTAL	$141,450		$396,700		$396,700		$396,700	

	AMOUNT	**AMOUNT**	**AMOUNT**	**AMOUNT**
Facilities	$0	$0	$0	$0
Equipment/Library Resources	$50,000.	$10,000	$10,000	$10,000
Travel	$10,000.	$10,000	$10,000	$10,000
Supplies	$5,000.	$5,000	$5,000	$5,000
SUB-TOTAL	$65,000.	$25,000.	$25,000.	$25,000
TOTAL EXPENSES	$206,450	$421,700	$421,700	$421,700
REVENUES				
Revenue Anticipated From:	**AMOUNT**	**AMOUNT**	**AMOUNT**	**AMOUNT**
*State Appropriations	$0	$0	$0	$0
*Federal Grants/Contracts	$200,000	$200,000	$300,000	$300,000
*State Grants/Contracts	$0	$0	$0	$0
*Private Grants/Contracts	$0	$0	$0	$0
Expected Enrollment	30	36	36	40

Tuition	221,040.00 (7368.00 x 30)	265,248.00 (7368.00 x36)	265,248.00 (7368.00 x36)	294,720.00 (7368.00 x40)
Fees	107,520.00 (3584.00 x 30)	129,024.00 (3584.00 x36)	129,024.00 (3584.00 x36)	143,360.00 (3584.00 x40)
*Other (specify)				
TOTAL REVENUES	$528,560.00	$594,272.00	$694,272.00	$738,080.00

**** Describe/explain expected sources of funds in proposal text.***

Budget Narrative

Year 1 Expenditure Justification

- **Personnel:**
  - **Faculty Member ($89,050):** A foundational faculty hire is crucial for establishing the academic core of the program in its inaugural year. This individual will be responsible for curriculum development, teaching initial courses, and providing academic guidance to the first cohort of students. Their expertise will be instrumental in setting the program's direction and ensuring quality instruction.
  - **Part-time Administrative Support Specialist ($27,400):** Even in the initial phase, administrative support is vital for the smooth operation of the program. This role will handle essential tasks such as student communication, scheduling, managing program-related paperwork, and assisting with logistical needs, freeing up faculty time for academic responsibilities.
  - **Student Fellowships (5 x $5,000 = $25,000):** Offering fellowships in the first year serves as a strategic recruitment tool. These financial incentives will attract highly qualified students to a new program, helping to build a strong initial cohort and enhance the program's reputation from the outset.
- **Equipment:**
  - **Laboratory Equipment ($50,000):** Equipping the laboratories is a fundamental requirement for any program with a practical or research component. This initial investment will provide the necessary tools and resources for hands-on learning, student projects, and potentially faculty research activities, ensuring students gain essential skills and experience.
- **Travel:**
  - **Faculty and Student Conference and Site Visits ($10,000):** Travel funds are allocated to facilitate professional development and exposure for both faculty and students. Attending conferences allows faculty to stay current in their fields, network with peers, and present research. Site visits can provide valuable real-world context and experiential learning opportunities for students, enriching their understanding of the program's focus.
- **Supplies:**
  - **Computer, Office, and Laboratory Supplies ($5,000):** This budget covers essential operational needs. Computers are necessary for faculty and potentially student use. Office supplies ensure the administrative functions can be carried out efficiently. Laboratory supplies are required for any practical activities and student projects conducted in the lab spaces.

Years 2-4 Expenditure Justification

- **Personnel:**
  - **Program Director ($123,000):** As the program matures and grows, a dedicated Program Director becomes essential for providing leadership, strategic direction, and overall management. This role will oversee curriculum development, faculty coordination, student affairs, program assessment, and external relations, ensuring the program's continued success and development.
  - **Faculty Members (2 x $89,050 = $178,100):** Expanding the faculty complement allows for a broader range of courses to be offered, reduces teaching load on

individual faculty members, and increases the program's capacity to accommodate a growing student body. Additional faculty can also bring diverse expertise and research interests to the program.
    - **Part-time Administrative Support Specialist ($27,400):** The administrative needs of the program will remain consistent, requiring continued part-time support for the tasks outlined in Year 1.
    - **Student Fellowships (5 x $5,000 = $25,000):** Maintaining the fellowship program into subsequent years helps to ensure continued recruitment of high-caliber students and reinforces the program's commitment to supporting promising scholars.
    - **Graduate Assistants (4 x $10,800 = $43,200):** Hiring graduate assistants provides valuable support for faculty research, teaching activities (e.g., grading, lab assistance), and other program-related tasks. This not only benefits the program's operational efficiency but also offers valuable professional development opportunities for the graduate students.
- **Equipment:**
    - **Laboratory Equipment ($10,000):** This ongoing equipment budget allows for upgrades to existing equipment, purchase of specialized items as the program's research or teaching needs evolve, and maintenance of the laboratory facilities.
- **Travel:**
    - **Faculty and Student Conference and Site Visits ($10,000):** Continued funding for travel remains important for the reasons outlined in Year 1, ensuring ongoing professional development for faculty and enriching learning experiences for students as the program progresses.
- **Supplies:**
    - **Computer, Office, and Laboratory Supplies ($5,000):** This recurring budget ensures that the program has the necessary consumables and resources to support its ongoing academic and administrative activities.

Appendix D: SACSCOC

Faculty Roster Faculty Roster Form
Qualifications of Full-Time and Part-Time Faculty

Name of Institution: GRAMBLING STATE UNIVERSITY

Name of Primary Department, Academic Program, or Discipline: BIOLOGY Department/ SUSTAINABILITY

Academic Term(s) Included: Fall 2026 **Date Form Completed:** 03/30/2025

NAME (F, P)	COURSES TAUGHT **Including Term, Course Number & Title, Credit Hours (D, UN, UT, G) [Dual]** Note – for substantive change prospectuses/applications, list the courses *to be taught*, not historical teaching assignments	ACADEMIC DEGREES & COURSEWORK **Relevant to Courses Taught, Including Institution & Major List specific graduate coursework, if needed**	OTHER QUALIFICATIONS & COMMENTS **Related to Courses Taught**
Dr. Nasir U. Ahmed (F)	PA 500 Principles-Public Administration (G) PA 512 Policy Formation/Implementation and Evaluation (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	MSS in Public Administration University of Dhaka, Bangladesh MPPA in Public Policy and Administration Mississippi State University Ph.D. in Political Science University of Mississippi	Statistical Consultant at the University of Mississippi Write Columns on politics, economics, and international affairs. Conduct Research on Major Public Policy issues (Welfare & entitlement Programs such as Medicaid, Medicare, Social Security, Food Stamp, Housing, & Student Loans etc) **Columns Published Abroad:** Our Planet Needs Cooperative Globalization with New Insights (Daily Sun) May 31, 2021. We Need to Be Alert and Enlightened (Daily Sun) Jan 1, 2021. America is Divided by Politics but United by Shared Values (Daily Sun) Nov 20, 2020. America's Agony: Police Brutality, Racism, and Dysfunction (Daily Sun) June 20, 2020

Dr. Geoffrey Lemmy Akoma (F)	PA 500 Principles-Public Administration (G) PA 512 Policy Formation/Implementation and Evaluation (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	Ph. D in Political Science Texas Tech University MPA in Master of Public Administration Texas Southern University B.Sc in Public Affairs Texas Southern University	**Presentations/Papers presented:** Co-Presenters: Healthcare Challenges of the Internally Displaced People (IDP): The Case of Africa. **Geoffrey Lemmy Akoma,** PhD, Grambling State University Ogbonnaya John Nwoha, PhD, Louisiana Tech University Frances Staten, PhD, Grambling State University Cameron Sumlin, PhD, University of Louisiana at Monroe. The Twelfth Annual National Civil Rights Conference, Residence Inn by Marriot, Tallahassee at the Capitol, Monday, May 19-20, 2024. Co-Presenter: Experiencing and addressing Post-Pandemic Challenges Association of Social and Behavioral Scientists Conference, March 20-23, 2024. Hilton Garden, Downtown, Jackson, Mississippi. Co-Presenter and Discussant: Examining Policy Failures on the Aftermath of COVID-19 or Is It Failure in Political Leadership? -- - the Truth, Ogbonnaya Nwoha, Louisiana Tech University; **Lemmy Akoma,** Grambling State University; Frances Staten, Grambling State University; Cameron Sumlin, University of Louisiana, Monroe, Mid-South Sociological Association Conference, Nashville, TN, October 13-15, 2022 Co-Presenter and Participant: Remembering and Researching Juneteenth Families and Individuals: A Video/Poster Presentation and Impact of COVID-19 Pandemic Policies on Diverse Population and Youth. Civil Rights Conference, Baton Rouge, LA, June 20, 2022. Presenter: The Impacts of Social Inequities on Healthcare Access for Racial and Ethnic Minorities: The Case of the COVID-

			19 Pandemic; National Civil Rights Conference, Oxford, Ohio, June 22, 2021 Co-Presenter: Islamic Fundamentalism and Rights of Women to Education in Nigeria. 8th National Civil Rights (Virtual) Conference, June, 2020. Presenter: Violation of the International Bill of Rights of Women of Africa: The Case of Boko Haram in Nigeria, at the Faculty Research and Creative Works Symposium, Black and Gold Room, Grambling State University, November 8, 2018. Presenter: Islamic Fundamentalism and Civil Rights of Women to Education in Nigeria: The Case of Boko Haram-Revisited, National Civil Rights Conference, Holiday Inn-Meridian, Tuesday, June 19, 2018. "What is the Top Reason for Global Black Poverty"? Co-Presenters, Drs. Fabian K. Nabangi, **Geoffrey Lemmy Akoma**, & John O. Nwoha; at the 26th Joint Conference of the National Association of African American Studies, National Association of Hispanic and Latino Studies, National Association of Native American Studies, and the International Association of Asian Studies; Double Tree Dallas Hotel Near the Galleria, Dallas, TX, February 12-17, 2018. Paper Presented to the Louisiana Advisory Committee to the U.S. Commission on Civil Rights: Civil Rights and Barriers to Voting, Public Session, Nursing Auditorium, Grambling State University, November 15, 2017. Paper Title: Challenge to Education of

			Women: The Case of Boko Haram in Northern Nigeria. The 82nd Annual Conference of the Association of Social and Behavioral Paper Title: Challenges Confronting the Universal Human Rights Movement
			6th National Civil Rights Conference, Meridian Mississippi, June 19-22, 2016. Co-Presenter: "Globalization and Maintenance of Human Rights: The Case of Ebola Spread", at the 41st Annual Conference of the Mid-South Sociological Association, October 22-24, 2015, Lafayette, LA. Co-Presenter: "Boko Haram Ideology Isolates Women from the National Development in Nigeria," Presented at the National Civil Rights Conference, June 2123, 2015, Holiday Inn, Meridian, Mississippi. Co-Presenter: "Interpretation of Public Policies: Is It an Overlooked Aspect of the Public Policy Process," **Lemmy G. Akoma**, Fabian Nabangi, Ogbonnaya Nwoha, and Frances Staten. SECoPA 2015 Conference, Embassy Suites Hotel Airport/Convention Center, Charleston, South Carolina, September 30-October 3, 2015.

Joyce Stubblefield (will be hired full-time when program is approved)	PA 500 Principles-Public Administration (G) PA 512 Policy Formation/Implementation and Evaluation (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	Doctoral Candidate, Ph.D. International Off-Campus doctoral program in Cleaner Products, Cleaner, Productions, Industrial Ecology, & Sustainable Development – 2013 (introduced); 2014 – present Erasmus University Rotterdam, The Netherlands Master in Sustainability and Development – 2012 Lyle School of Engineering Southern Methodist University Master of Business Administration (Management) - 1984 Amberton University, TX Environmental Scientist- 2010-2022 Adjunct Faculty -2013-2021 -Southern Methodist University Taught Sustainability Leadership, Earth Matters, Climate Change	Responding to Megatrends for Resilient and Sustainable U.S. Cities (2016) Alan Hecht1*, Joyce Stubblefield2, Keely Maxwell3 (2016, Jacobs Journal of Environmental Sciences) Sustainability and the Humanities (2018), Chapter 8: Religious Organizations Bringing Sustainability Closer to Reality: Academic Contributions to Environmental Sustainability and Climate Resilience that Can Help Faith Leaders Build Communities that Are Environmentally, Socially and Economically Sustainable: Part 1—A Literature Review, pages 141-159, Stubblefield, Joyce and Bouma, Jan Jaap, ISBN-13: 9783319953366, (2018, Springer) Corporate Sustainability (2018),The Next Steps Towards a Sustainable World, Routledge Chapter 8: Faith-based organizations and corporate sustainability, pages Joyce Stubblefield and Jan Jaap Bouma, 9781138193758 (2018, Routledge) **PROFESSIONAL LEADERSHIP EXPERIENCES** (Last 3-5 years) First Sustainability Advisor for the Louisiana 2016 Floods – 2016-2017 Three-year sustainability and research project created with Ouachita Parish and awarded $100,000 – 2017-2020 US EPA Sustainable Materials Management Federal Green Challenge Lead – 2013 - Present U.S. EPA Regional Federal Facilities Program Managers (FFPM) – 10 years U.S. Lead Region for National Federal Facilities Program (2005, 2006)

Dr. Bassidy Dembele (F)	SU 601 Data Analytics & Statistical Analysis (G) SU 602 Data Visualization (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	Ph.D. in Mathematical Biology, Howard University M.S. in Mathematics, Howard University M.S. in Computer Science, Louisiana Tech University. M.S. in Applied Mathematics, University of Bamako, Mali B.S. in Applied Mathematics, University of Bamako, Mali	**B. Dembele**.; A. Friedman. ; A. A. Yakubu.: Malaria model with periodic birth and death rates. Journal of Biological Dyanamics (Published), July 2009. **B. Dembele.**; A. Friedman. ; A. A. Yakubu.: Mathematical model for testing the effectiveness of sulfadoxine pyrimethane as temporary malaria vaccine. Bulletin of Mathematical Biology (Published), May 2010. **B. Dembele**.; A. A. Yakubu.:Optimal treated mosquito bed nets and insecticides for eradication of malaria in Missira, DCDS-B Vol. 17, no.6, September 2012. **B. Dembele**.; A. A. Yakubu.: Controlling Imported Malaria cases in the United States of America, the special issue of Mathematical Biosciences and Engineering, MBE, Volume 14, Number 1, February 2017. **Directed Student Research** -Summer 2024 Mathematical model for controlling the spread of Covid19 in Louisiana. **Skills**: Data Engineering & Machine Learning Data Analytics and Data Visualization SAS Certified Base Programmer for SAS 9.

Dr. Waneene C. Dorsey (F)	SU 501 Introduction to Sustainability (G) SU 502 Fundamentals of Ecology for Sustainable Ecosystems (G) SU 503 Environmental Quality and Toxicology (G) SU 603 Climate Change and Sustainable Energy (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	PhD in Environmental Science Jackson State University M.A.T. in Natural Science Grambling State University	**Dorsey, W.C.** and Tchounwou, P.B. 2004. Cytotoxic, mitogenic, and estrogenic effects of pentachlorophenol in primary hepatocyte cultures obtained from channel catfish (Ictalurus punctatus). International Journal of Environmental Research and Public Health. 1(2): 90-99. **Dorsey, W.C.**, Tchounwou, P.B. and Sutton, D. 2004. Mitogenic and cytotoxic effects of pentachlorophenol to AML 12 mouse hepatocytes. International Journal of Environmental Research and Public Health. 1(2): 100-105. **Dorsey, W.C.**, Ford, B.D., Roane, L., Haynie, D. T, and Tchounwou, P. B. 2005. Induced mitogenic activity in AML-12 mouse hepatocytes exposed to Low-dose Ultra-Wideband Electromagnetic Radiation. International Journal of Environmental Research and Public Health. 2(1):24-30. **Dorsey, W.C.**, Tchounwou, P. B., Ford, B. D. 2006. Neuregulin 1-βeta cytoprotective role in AML 12 mouse hepatocytes exposed to pentachlorophenol International Journal of Environmental Research and Public Health. 3(1), 11-22. Yedjou, C., Haynes, L., **Dorsey, W.,** McMurray R. and Tchounwou, P.B. 2008. Lead-induced cytotoxicity and oxidative stress in human leukemia (HL-60) cells. Eds Collery Ph., Theophanides, T., Khassanova L., and Collery T. Metal ions in Biology and Medicine. John Libbey Eurotext, Paris. 10:489-494. Yedjou, C.G., Musabbir, A.S., Saeed, M.A., **Dorsey, W.**, Yu, H, and Tchounwou, P.B. 2012. Basic apoptotic and necrotic cell death in human liver carcinoma (HepG2) cells induced by synthetic azasmacrocycle. Environmental Toxicology, 1, 1-7. **Dorsey, W.C.** 2015. Mitogen-activated protein kinase (MAPK) signaling pathway and mammalian cells. Transcriptomics. 3(2):116. Kaur, G., Pinkston, R., Mclemore, B., **Dorsey, W.C.**, Batra, S. 2018. Immunological and toxicological risk

			assessment of e-cigarettes. European Respiratory Review. 27:170119-2017. Thota, S., Begum, R., Kaur, G., Bagam, P., **Dorsey, W.**, and Batra, S. 2022. Pentachlorophenol mediated regulation of DAMPs and inflammation: In vitro study. Toxicology in Vitro. 83:105378. Thota, S., Begum, R., Kaur, G. Begam, P., **Dorsey, W.**, and Batra S. Sept. 2022. Pentachlorophenol mediated regulation of DAMPs and infrommation: In Vitro study. Toxicology In Vitro. Oral Presenter—Louisiana Biomedical Research Network 18th Annual Meeting. Research: "Evidence of Inflammatory Responses in Lung A549 Alveolar Epithelial and Human Liver Carcinoma HepG2 Cells Exposed to Pentachlorophenol."; 2020. Textbooks Biology Part I - Pressbooks editor. Authors: Stephanie Aamodt, Jennifer Blanchard, Ruby Broadway, Hope Clay, Christian Clement, Waneene Dorsey, Sarah Hunter, Illya Tietzel, and Peter Yaukey, with editors Emily Frank, Elizabeth Joan Kelly, and Maletta Payne. Biology Part I – Simple Book Publishing Environmental Science – Pressbooks editor. Authors: Bill Freedman; Waneene Dorsey; Adronisha Frazier; Murty Kambhampati; John Galiotos; and Soma Mukherjee Environmental Science – Simple Book Publishing Presentations Dorsey, W. Keynote Speaker—"Pentachlorophenol: Inflammatory responses of a persistent environmental contaminant"—The 29th International Interdisciplinary Conference on the Environment (IICE) on November 2, 2024. Interdisciplinary Environmental Association. Louisiana State University, Shreveport, LA. **Directed Student Research:** **Dorsey, W.**, Louis Boahene, Albert Nyaunu, Daniel Uzoma, Michael Adofo, and Nakiyah Allen. "Modulation of Inflammatory Proteins and Cancer Cell Survival in TIB73 Mouse Liver

			Cells Exposed to Pentachlorophenol." The 99th Louisiana Academy of Sciences: Louisiana State University, Alexandria, LA, March 15, 2025. Dorsey, W., Life Makarudze, John Mosopefoluwa, Daniel Uzoma, Nonso Duaka, and Mofetoluwa Akinkoye. "Cancer Progression and the Disruption of the Cell Cycle in TIB73 Mouse Liver Cells Exposed to Pentachlorophenol." The 99th Louisiana Academy of Sciences: Louisiana State University, Alexandria, LA, March 15, 2025. Dorsey, W. and Michael Adofo. "The ERK-Ras MAPK Pathway: Key Mechanism to Cancer Survival in TiB73 Mouse Liver Cells Exposed to Pentachlorophenol." The 99th Louisiana Academy of Sciences: Louisiana State University, Alexandria, LA, March 15, 2025. Dorsey, W., Favour Aina, Mofetoluwa Akinkoye, Life Makarudze, Ifeanyi J. Njoku, and Samuel Torto. "Inflammatory Microenvironment for Cancer Cells in TIB73 Mouse Liver Cells Exposed to Pentachlorophenol." Annual University of Louisiana System Academic Submit, April 12, 2024, Louisiana Tech University, Ruston, LA. **Dorsey, W., S. Telemacque, G.Dupre, D. Kee, L. Lovell and T. Simmons. Autophage mechanisms: Friend or enemy in TIB-73 mouse liver cells exposed to pentachlorophenol,** GSU Undergraduate Research Symposium, Grambling State University, February 2023. **Gateways to Cancer: Pentachlorophenol Orchestration of Inflammatory Proteins in TIB-73 Mouse Liver Cells: Derrick Kee and Ms. Tatum Simmons,** GSU Undergraduate Research Symposium, Grambling State University, February 2023. **Dissertation Committee Member-Methodologist for ED.D. Candidate Eldrie B. Hamilton, Developmental Education ED.D. Program, Grambling State University, Grambling, LA (2019-2021). Dissertation Thesis, "Learning Experiences of African American Students in an Online Developmental English Course at a Four-**

			year Public University: A Phenomenological Study." Dissertation Committee Member-Methodologist for ED.D. Candidate LaTina S. Johnson, Developmental Education ED.D. Program, Grambling State University, Grambling, LA (2019 – 2021). Dissertation Thesis, "An Existential Phenomenological Influence on the Persistence of Returning Stopout Nontraditional Students Rooted in Electronic Learning." Dissertation Committee Member for Ph.D. Candidate Phatia Wells-McClellan, Environmental Science Ph.D. Program, Jackson State University, Jackson, MS (2016 - Fall 2017). Dissertation Thesis, "Modulation of Arsenic Trioxide on Human Induced Pluripotent Stem Cell. Dissertation Committee Member for Ph.D. Candidate Jameka Grisby, Environmental Science Ph.D. Program, Jackson State University, Jackson, MS (2016 - Spring 2017). Dissertation Thesis, "Role of MRCL3 in 2-butane modulation of Pancreatic Cancer Dissertation Committee Member for Dr. Ericka T. Brown, Environmental Science Ph.D. Program, Jackson State University, Jackson, MS (2010 – Spring 2012). Dissertation Thesis, "Molecular and Cellular Mechanisms Involved in Arsenic Toxicity to Human Hepatocellular Carcinoma (HepG2) Cells." Dissertation Committee Member for Dr. MacArthur Billing, Jr., Biodefense Ph.D. Program, George Mason University, Fairfax, VA (2008 - Summer 2010). Dissertation Thesis, "Bacillus anthracis Decontamination Effectively Communicating Risk during Crisis."

Dr. Hector Donald Douglas III (F)	SU 501 Introduction to Sustainability (G) SU 502 Fundamentals of Ecology for Sustainable Ecosystems (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	PhD in Marine Biology University of Alaska Fairbank MS in Biology Wake Forest	**Douglas, H.D.** 2022. Scent feathers: a shared derived trait in the Genus Aethia? ID #V69, Evolution 2022, Am. Soc. Naturalists/Soc. Study of Evol./Soc. Systematic Biol., Jun 21-28, Cleveland, OH **Douglas, H.D.** 2022. Scent feathers: a shared derived trait in the Genus Aethia? Abstract # 771, Annual Mtg. Animal Behavior Society, Costa Rica **Douglas III, HD** (in review, Journal of Ornithology) Marine fluorescent pigment is negatively correlated with lipid peroxidation in avian blood plasma. **Presentations:** Douglas, H., Drummond, B., Kitaysky, A., Kitaiskaia, E., Budge, S. 2022. Colony failure or colony collapse? Absence suggests functional loss of crested auklets (Aethia cristatella) at Big Koniuji I., Alaska. 2nd International Electronic Conference on Diversity (IECD 2022)—New Insights into the Biodiversity of Plants, Animals and Microbes, March 15-31, 2022. **Douglas, H.** 2022. Scent feathers: a shared derived trait in the Genus Aethia? Seabirds Unite: 49th Annual Meeting of the Pacific Seabird Group, Feb. 22-25, 2022. **Douglas, H.**, Drummond, B., Kitaysky, A., Kitaiskaia, E., Budge, S., Springer, S. 2022. Colony failure or colony collapse? Absence suggests functional loss of crested auklets (Aethia cristatella) at Big Koniuji I., Alaska. Seabirds Unite: 49th Annual Meeting of the Pacific Seabird Group, Feb. 22-25, 2022. **Douglas, H.D.** 2022. Scent feathers: a shared derived trait in the Genus Aethia? 2022 Alaska Marine Science Symposium, Anchorage, AK, Jan. 24-27. **Douglas, H.D.**, Drummond, B. 2022. Colony failure or colony collapse? Absence suggests functional loss of crested auklets

			at Big Koniuji I., Alaska. 2022 Alaska Marine Science Symposium, Anchorage, AK, Jan. 24-27. **Research Activities:** **Additional Training:** Marine Transport Processes, Harbor Branch Oceanographic Institute Bio acoustical Oceanography, University of California Santa Cruz Remote Sensing Oceanography, Bermuda Biological Station for Research **Directed Student Research:** Bristo, A. and **H. Douglas** 2023. Plastics among the plankton: plastic ingestion by planktivorous seabirds. 97th Annual Meeting of the Louisiana Academy of Sciences, Mar. 3, Louisiana State University Alexandria, Alexandria, LA Duaka, N., Torto, S., Aina, F., Osborne, M., and **H. Douglas** 2025. Do weight loss drugs affect the survival and productivity of aquatic invertebrates? 99th Annual Meeting of the Louisiana Academy of Sciences, Mar. 15, Louisiana State University Alexandria, Alexandria, LA Mujumi, T., and **H. Douglas** 2025. Does the structure of tropical forests shape bird song? 99th Annual Meeting of the Louisiana Academy of Sciences, Mar. 15, Louisiana State University Alexandria, Alexandria, LA Chisley, C., and **H. Douglas** 2025. Seabird monitoring at Culebra National Wildlife Refuge. 99th Annual Meeting of the Louisiana Academy of Sciences, Mar. 15, Louisiana State University Alexandria, Alexandria, LA Floyd, K., and **H. Douglas** 2025. Seabird response to marine heat wave in the Caribbean Sea. 99th Annual Meeting of the Louisiana Academy of Sciences, Mar. 15, Louisiana State University Alexandria, Alexandria, LA

Dr. Prakash Meppaloor Gopalakrishnan Nair (F)		SU 501 Introduction to Sustainability (G) SU 502 Fundamentals of Ecology for Sustainable Ecosystems (G) SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G)	PhD in Forestry (Botany specialization) Forest Research Institute MS in Botany Annamalai University	**Research Assistant Professor (University of Seoul)** Course taught: Special Topics in Environmental Monitoring Relevant research: 1.Assessment of nanoparticle-based formulations and natural compounds for antibacterial and antibiofilm effect. 2. Multilevel effect of engineered nanoparticles, and environmental pollutants on aquatic organisms and plants. Research: Assessment of nanoparticle based formulations for antibacterial and antibiofilm Research: "Responses of Arabidopsis thaliana seedlings exposed to engineered metal and metal oxide nanoparticles Research: Plant Physiology and Biochemistry' and 'Biologia **Patent:** Jinhee Choi, Sun Young Park, **Prakash M. Gopalakrishnan Nair**, Gi-woong Chung, SiWon Lee (2012). Biomarker for evaluating sediment ecotoxicity of silver nanoparticles from aquatic midge, Chironomus riparius and the uses thereof (Korean Patent Number: 10-1344809). **Book Chapter (Peer-reviewed):** **Prakash M. Gopalakrishnan Nair** (2017). Toxicological impact of carbon nanomaterials on plants (Environmental Chemistry for a Sustainable World - Nanotechnology, food security and water treatment, Springer)

				Publications: Prakash M. Gopalakrishnan Nair, Takudzwa Mawisire (2025). Antibiofilm efficacy of biosynthesized gold nanoparticles enhances the antibiotic sensitivity of Acinetobacter baumannii (manuscript under submission). **Prakash M. Gopalakrishnan Nair**, Ill Min Chung (2017). Evaluation of stress effects of copper oxide nanoparticles in Brassica napus L. seedlings. 3Biotech (Accepted) [I/F: 1.361] **Prakash M. Gopalakrishnan Nair**, Ill Min Chung (2017). Regulation of morphological, molecular level changes and macro and micronutrient status in Arabidopsis thaliana seedlings exposed to zinc oxide nanoparticles and zinc ions. Science of the Total Environment 575, 187-198. [I/F: 4.9/Citations 2] **Prakash M. Gopalakrishnan Nair**, Ill Min Chung (2016). Determination of zinc oxide nanoparticles toxicity on root growth in wheat (Triticum aestivum L.) seedlings. Acta Biologica Hungarica 67(3), 286-296. [I/F: 0.506/Citations 1] **Prakash M. Gopalakrishnan Nair**, Ill Min Chung (2015). Biochemical, anatomical and molecular level changes in cucumber (Cucumis sativus) seedlings exposed to copper oxide nanoparticles. Biologia 70/12, 1575-1585. [I/F: 0.850/Citations 2] **Prakash M. Gopalakrishnan Nair**, Ill Min Chung (2015). Alteration in the expression of antioxidant and detoxification genes in Chironomus riparius exposed to zinc oxide 7 nanoparticles. Comparative

				Biochemistry and Physiology: Part B 14, 190:1-7. [I/F: 1.757/Citations 3] **Prakash M. Gopalakrishnan Nair**, III Min Chung (2015). The responses of germinating seedlings of green peas to copper oxide nanoparticles. Biologia Plantarum 59, 591- 595. [I/F: 1.551/Citations 7] **Prakash M. Gopalakrishnan Nair**, III Min Chung (2015). Physiological and molecular level studies on the toxicity of silver nanoparticles in germinating seedlings of mung bean (Vigna radiata L.). Acta Physiologiae Plantarum 37, 1719. [I/F: 1.364/Citations 15] **Prakash M. Gopalakrishnan Nair**, III Min Chung (2015). Study on the correlation between copper oxide nanoparticles induced growth suppression and enhanced lignification in Indian mustard (Brassica juncea L.). Ecotoxicology and Environmental Safety 113, 302-313. [I/F: 3.743/Citations 21] **Directed Student Research:** Davis Antoina, Ross Nakada, Meppaloor Gopalakrishnan Nair Prakash (2025). Therapeutic Potential of Myrtenol in Targeting Biofilm-Associated Infections Caused by Acinetobacter baumannii. Biomedical Research and Industry Day (BRAID) at LSU Health Shreveport, November 1, 2024. Antibacterial effects of bio-synthesized gold nanoparticles using leaf extracts from medicinal plant *Cotharanthus roseus*: Nakada Ross and Takudwza Mawisire

Dr. Abdul Khaliq (F)	SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G) ET 603 Sustainable and Renewable Energy Concepts (G) ET 604 Photovoltaic Energy Systems (G) ET 605 Power System Analysis (G) ET 606 Grid Design and Operation (G)	Ph.D. in Engineering Louisiana Tech University M.S. in Electrical Engineering Louisiana Tech University	**Sustainable Energy Experience** Preparing for NABCEP certification exams for solar installations Trained on solar and wind equipment for students training equipment available at department Completed NIST-RACER Fundamentals of Solar Photovoltaic Design and Installation **Skills and expertise:** MATLAB Simulation Electrical & Electronics Engineering **Publications:** Suvhashis Thapa, Sam Chukwu, **Abdul Khaliq**, Leland Weiss, Fabrication and analysis of small-scale thermal energy storage with conductivity enhancement,ISSN 0196-8904, https://doi.org/10.1016/j.enconman.2013.12.019 Chivukula, Venkata & Wang, Ming & Ji, Hai-Feng & **Khaliq, Abdul** & Fang, Ji & Varahramyan, Kody. (2006). Simulation of SiO2-based piezoresistive microcantilevers. Sensors and Actuators A: Physical. 125. 526–533. 10.1016/j.sna.2005.08.038. **Khaliq, Abdul** & Liu, X & Nohria, R & Su, Yimeng & Varahramyan, Kody. (2005). Extraction of Damping Coefficients of Comb Drive by Partitioning. 2005 NSTI Nanotechnology Conference and Trade Show - NSTI Nanotech 2005 Technical Proceedings. Jiang, Beini & Dai, Weizhong & **Khaliq, Abdul** & Carey, Michelle & Zhou, Xiaobo & Zhang, Le. (2014). Novel 3D GPU based numerical parallel diffusion algorithms in cylindrical coordinates for health care simulation. Mathematics and Computers in Simulation. 109.10.1016/j.matcom.2014.07.003. Thapa, Suvhashis & Chukwu, Stanley & **Khaliq, Abdul** & Weiss, Leland. (2014). Fabrication and analysis of small-scale thermal energy storage with conductivity enhancement. Energy Conversion and Management. 79. 161–170.10.1016/j.enconman.2013.12.019.

Dr. Benedict N. Nwokolo (F)	SU 698 MS Thesis Research I – Sustainability SU 699 MS Thesis Research II – Sustainability SU 699L Professional Internship Experience SU 698 MS Thesis Research I – Sustainability (G) SU 699 MS Thesis Research II – Sustainability (G) SU 699L Professional Internship Experience (G) ET 610 An Overview of Sustainable Building Technology (G) ET 611 Principles of Green Buildings (G) ET 612 Sustainable Materials Methods, and Equipment (G) ET 613 Energy Efficient Building Design (G) **ET 6XX Advanced Engineering Economy**	B.S.C.E. - Purdue University – Major: Construction; Minor: Structure and Transportation. M.S. in Computer Science Jackson State University M.S. in Engineering Mississippi State University Ph.D. in Civil Engineering Louisiana Tech University EngD in Construction Engineering Technology Commonwealth University of Business, Arts and Technology	**Training:** Industrial Training as Construction Engineering Cost Estimator CM-at-Risk: Contracting for Owners, Consulting Engineers, and Contractors Completion of the Associated General Contractors of America's Advanced Management Program, a Professional Development Program Construction Cost Estimating award by the American Society of Civil Engineers (ASCE). "Application of Soil-Structures Interaction to Buildings and Bridges". Post Tensioning Construction and Wind Loads awarded by ASCE. Earned 1.4 CEUs in Construction Administration awarded by ASCE. Demonstrated a commitment to engineering excellence through lifelong learning awarded by ASCE. Training by National Highway Institute on "Low cost operational and safety improvements for two-lane roads". Designing Reinforced Concrete by the American Concrete Institute (ACI) Concrete Practical Concrete Materials Seminar sponsored by the American Concrete Institute. Earned Masterclass Certificate in Business Management & Leadership 2022 by London Graduate School via it Commonwealth University.

Dr. Edwin Thomas (F)	SU 501 Introduction to Sustainability SU 698 MS Thesis Research I – Sustainability SU 699 MS Thesis Research II – Sustainability SU 699L Professional Internship Experience ET 603 Sustainable and Renewable Energy Concepts (G)	Ed.D. in Higher Education Administration & Management Grambling State University MS in Industrial & Engineering Technology Northwestern State University	HBCU presenter/panelist for L3Harris Technologies to discuss the impact of how HBCU engineering and engineering technology programs prepare their graduates for job placement in the workforce sector. 2023 EPA/GSU MOU - Memorandum of Understanding with the U.S. Environmental Protection Agency, the focus was on preparing students to enter and compete in the federal workforce, providing expertise to review and enhance curriculums, and participate on researching efforts to promote environmental awareness. Team member for the development of an EPA grant to Promote Sustainable Energy Technologies: Microgrids Systems at Grambling State University and the Neighboring Communities Lee, Hyun S.; Kim, Yoon D.; and Thomas, **Edwin B.** Integrated Educational Project of Theoretical, Experimental, and Computational Analysis. ASEE Gulf-Southwest Section Annual Conference, The University of Texas at Austin, Presenter. 2018 Thomas Edwin B., Louisiana Highway Safety Commission-Encourage Highway Safety Among University Students. Presenter 2018 Thomas Edwin B., "A Study on the Impact of Cognitive and Non-Cognitive Factors on the Mathematics Academic Performance of African American Engineering Students." Ph.D. thesis, Grambling State University, UMI Company, Ann Arbor, MI, Aug. 11. 2000. Thomas Edwin B., "An Evaluative Study of Mechanical CAD Training" Rockwell International Document No. WP85-3041, Presented, July 198 Rockhurst College Certificate of Training in Total Quality Management Printed Circuit Board (PCB) Prototyping Systems Operation Training, LPKF Laser & Electronics

			Digital Education and Training ALL-IN-1 V2.4 Computer System Administrator Accreditation Board for Engineering & Technology (ABET) **Research** Lee, Hyun S.; Kim, Yoon D.; and Thomas, Edwin B. "Integrated Educational Project of Theoretical, Experimental, and Computational Analysis." Bienville Parish Broadband Access Study **Professional Experience & Practice:** DuBois, Carman and Associates Marine Engineering & Ship Architects Draftsman/Designer/Estimator/ Project Engineer Rockwell International, Technical Support Staff Engineer –Mechanical CAD Designer Alfred Stansberry, Architect & Planner, Computer Graphics Coordinator/Designer Louisiana State Department of Economic Development, Division of Economically Disadvantaged Business Development, Louisiana Contractor's Accreditation Institute, Consultant/Lecturer Melyn Construction Company, Supervisor/Foreman Thomas Home Designs, Owner/Designer/Design Consultant

Dr. Olusegun Adeyemi (F)	SU 501 Introduction to Sustainability SU 698 MS Thesis Research I – Sustainability SU 699 MS Thesis Research II – Sustainability SU 699L Professional Internship Experience ET 603 Sustainable and Renewable Energy Concepts (G) ET 604 Photovoltaic Energy Systems (G) ET 610 An Overview of Sustainable Building Technology (G) ET 611 Principles of Green Buildings (G) ET 612 Sustainable Materials Methods, and Equipment (G) ET 613 Energy Efficient Building Design (G)	Ph.D. in Engineering Sanford University M.S. in Mechanical Engineering	**Professional Development** – Solar/Wind Energy Training System **ADDITIONAL (RECENT) TRAINING** • Operation & programming of Industrial Robots • Quality Matters Certification • Problem Based Learning (PBL) Workshop. Boston University Photonics Center, Boston, MA. Sponsored by the New England Board of Higher Education (NEBHE) **PROFESSIONAL EXPERIENCE** INDUSTRIAL. 2007 – 2008: Engineering/Telecommunications Consultant, Seegron & Associates, Atlanta, GA. Summer 1992: Proctor & Gamble Company, Cincinnati, OH. One-week Workshop on the Principles and Practice of Total Quality Management (TQM) Philosophy . Summer 1988, 1989, 1990 & 1991: 3M Company, St. Paul, MN. Pressure Sensitive Adhesive (PSA) Technology Center. Visiting Faculty/Scientist. 1992 – 1973: West African Portland Cement Company, Ewekoro, Nigeria. Mechanical Engineer. **PROFESSIONAL MEMBERSHIP (Current and Past)** • Registered Professional Engineer (P.E) • PCEP – Python Certified Entry Level Programmer Certification • American Society for Engineering Education (ASEE) • National Association of the Electrical and Computer Engineering Technology Head of Department Association • ASTM (formally known as American Society for Testing and Materials) International • ASME (American Society of Mechanical Engineer)

			• SME (Society of Manufacturing Engineers) **ADDITIONAL CERTIFICATIONS & COMPLETED TRAININGS** • Teaching Online-An Introduction to Online Delivery (TOL) • Applying the QM Rubric (APPQMR) • Designing Your Online Course (DYOC) • ACUE Creating an Inclusive and Supportive Online Learning Environment • PCEP – Python Certified Entry Level Programmer Certification • ULS Empowering AI Literacy Microcredential Course • Course Hero AI Academy Course
Kenneth Rhodes (F)	ET 603 Sustainable and Renewable Energy Concepts (G) ET 604 Photovoltaic Energy Systems (G) ET 605 Power System Analysis (G) ET 606 Grid Design and Operation (G)	B.S. in Engineering Technology Grambling State University M.S. in Electrical Engineering Louisiana Tech University	**Professional Development** – Solar/Wind Energy Training System. **Business Analyst Intern** Accenture/Entergy | Remote Dates Employed: January 2023-May 2023 Responsibilities • Daily testing of regression scripts and reporting on errors. • Writing test scripts for Maximo software and testing them. • Assisted senior team members with solving scripting errors.
Lane Elien (P)	ET 603 Sustainable and Renewable Energy Concepts (G) ET 604 Photovoltaic Energy Systems (G) ET 605 Power System Analysis (G) ET 606 Grid Design and Operation (G)	B.S. in Engineering Technology Grambling State University M.S. in Electrical Engineering Louisiana Tech University	**EPA/GSU MOU** - Memorandum of Understanding with the U.S. Environmental Protection Agency, the focus was on preparing students to enter and compete in the federal workforce, providing expertise to review and enhance curriculums, and participate on researching efforts to promote environmental awareness. **SUMMARY OF QUALIFICATIONS:** • Solid engineering background with strong interest in application development, energy generation, machine learning, communication systems, robotics, and automatic control systems

			• Proficient in MATLAB, LabVIEW, C, C++, Java, FPGA, Python, Fanuc Robot programming and embedded controller programming, RF antenna testing • Antenna Design and simulation and experience using MATLAB Antenna Toolbox and Sonnet • Antenna fabrication, testing, and validation using PCB CNC and Vector Network Analyzer • Utilized OpenCV and TensorFlow for classification of objects using Nvidia Jetson Nano • Excellent leadership, communication, and project management skills **PROFESSIONAL EXPERIENCE:** **Research & Development Engineer II (Robotics) August 2023 to present** *Vermeer Corporation, Pella, IA, 50219* Tested 4D Radar, LIDAR, Thermal Camera sensor technologies to determine feasibility for future applications Developed safety modules for operating Electric tractor platform in Simulink Designed and maintained schematic and harness diagrams for new electrically controlled hydraulic implement Modeled robot perception system using ROS2 framework Communicated findings with company engineers at Expos, Technology Roadmaps and by writing technical reports **Adjunct Instructor August 2023 to present** *Engineering Technology Dept., Grambling State University, Grambling, LA, 71245* Developed and taught courses in Electronics Engineering Technology **Program Coordinator for Electronics Engineering Technology Sept 2018 to August 2023** *Engineering Technology Dept., Grambling State University, Grambling, LA, 71245*

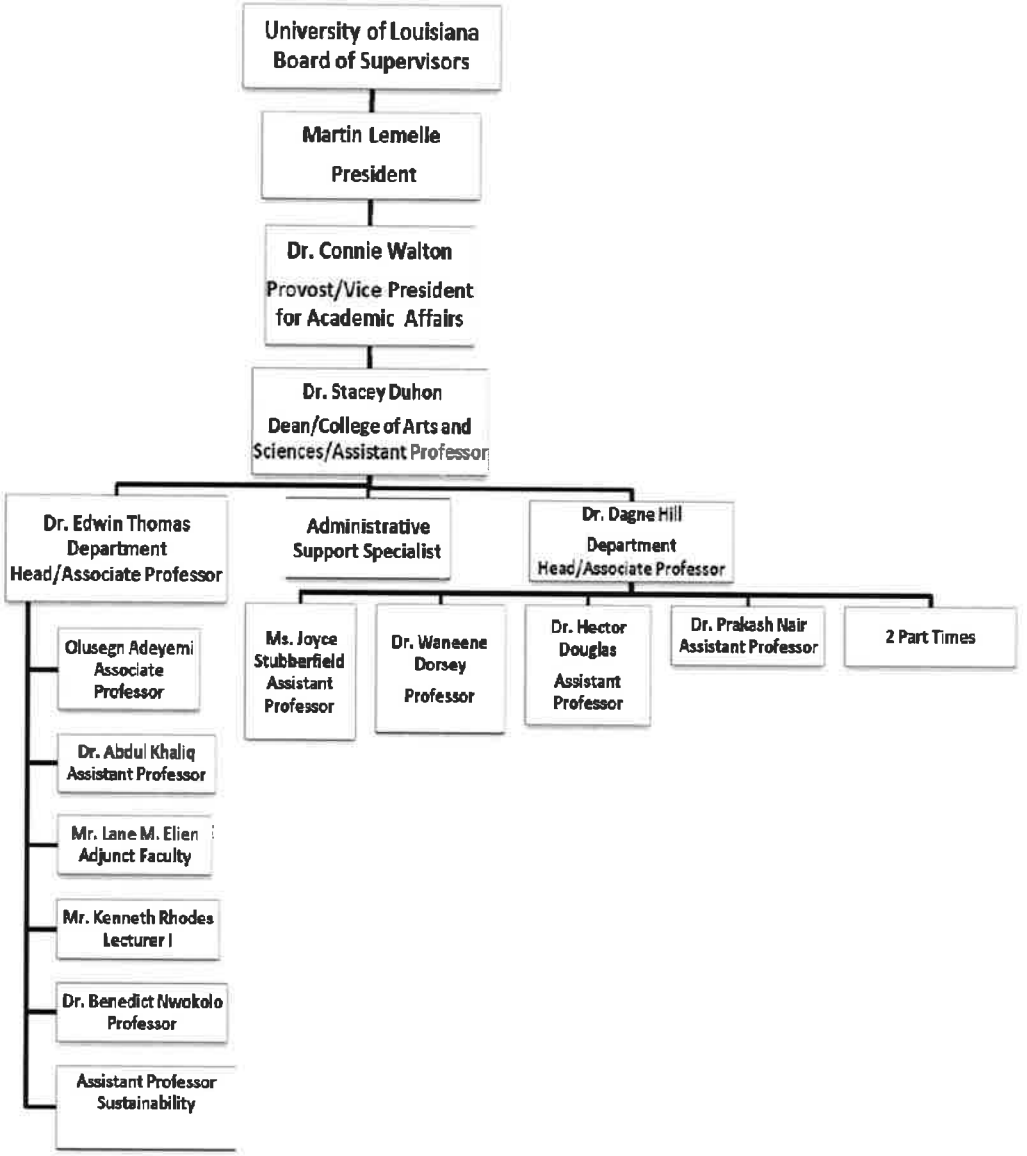
			Organized department course schedule for electronics courses and electives Developed self-study document for EET concentration for ABET accreditation in 2019 Oversaw the modernization of electronics and circuits & machines, and instrumentation & measurement laboratories using Title III funds costing $350,000 grant funds Co-Activity director for Title III Activities in the Engineering Technology Department Developed and maintained industry relations with the industrial advisor board members for the EET program
New Hire- Assistant Professor		**Credentials to support teaching in Green Buildings Concentration**	

Abbreviations: F, P: Full-time or Part-time; D, UN, UT, G: Developmental, Undergraduate Nontransferable, Undergraduate Transferable, Graduate; Dual: High School Dual Enrollment Course

Appendix E: Org Chart

MS in Sustainability

Grambling State University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2 Part Times