

**2022-2023 Legislative Budget Request
Integrated Advancement for the
FAMU-FSU Joint College of Engineering**

**State University System
Education and General
2022-23 Legislative Budget Request
Form I**

University(s):	Florida A&M University and Florida State University
Request Title:	Integrated Advancement for the Joint College of Engineering
Date Request Approved by University Board of Trustees:	Pending Board of Trustees Approval August 5, 2021
Recurring Funds Requested:	\$6,620,000
Non-Recurring Funds Requested:	
Total Funds Requested:	\$6,620,000
Please check the request type below:	
Shared Services/System-Wide Request	<input checked="" type="checkbox"/>
Unique Request	<input type="checkbox"/>

- I. Purpose** – 1. Describe the overall purpose of the plan, specific goal(s) and metrics, specific activities that will help achieve the goal(s), and how these goals and initiatives align with strategic priorities and the 2021 University Accountability Plan established by your institution (include whether this is a new or expanded service/program). If expanded, what has been accomplished with the current service/program? 2. Describe any projected impact on academic programs, student enrollments, and student services. University of Distinction proposals should also address the requirements outlined in the separate guidance document.

Thirty-nine years ago, the State of Florida boldly created the nation’s most unique shared College of engineering bringing together Florida Agricultural and Mechanical University, the leading public historically black university, with Florida State University, one of the America’s 100 top research universities. Students graduate from either FAMU or FSU, but study engineering together on our shared engineering campus.

The Florida Department of Economic Opportunity recognizes that expanding engineering education is critical to Florida’s future growth. Thanks to our partnership that merges excellence in research and diversity, we are the only engineering school in the U.S. that provides top research educational opportunities to a student population that reflects the diversity of Florida and our nation. We are also far above national averages with 28 percent females in our undergraduate class. In addition, for the last two-years we have been the #4

producer of PhDs to African Americans of any U.S. school. Since engineering is a team sport, the diversity of our design teams provides experiences that are highly prized by corporations and these benefits accrue to all of our students, whether majority or minority.

In the six years since the Legislature and partner university leadership recommitted to the Joint College, we have seen an increase in most areas of 25 percent or more with a faculty of 126, graduating 520 engineers each year and securing \$25 million external research funding annually. This growth was fueled by carryforward that is now depleted, and the future is jeopardized by the inadequate E&G funding to the College's joint budget. If we are to sustain the recent very positive momentum, we must have financial support. Growing national recognition for the power of this grand experiment in the State of Florida will be disrupted if we do not receive an increase this year.

The investment will pay off handsomely for FAMU, FSU and the State of Florida. The wonderful thing is that success of the FAMU-FSU College of Engineering helps both our partner universities achieve their strategic goals. Florida State is a member of the *U.S. News* top-twenty national public universities, and the College of Engineering is ranked #2 of all engineering schools in Florida by *U.S. News* and #40 nationwide as a doctoral-granting undergraduate engineering school. This high ranking reflects the unique strength of the partnership between FAMU and FSU. Yet the College of Engineering is only 1/3 the size of the average in the top 20 public universities and must grow to fuel FSU's longer-term advancement in the rankings. And, FAMU is already one of the leading Historically Black College or University (HBCU) in research and doctoral degree production, but it could become the first HBCU to reach the elite of top research universities with the help of the Joint College of Engineering. Together, FAMU and FSU can do something that no other university in the U.S. can accomplish by training an inclusive, diverse, and excellent workforce to fuel our state's engineering labor needs. Both universities have generously provided financial support to help the College, but the joint LBR is the only sustainable way of ensuring that the partnership endures and flourishes.

We have programs planned that will significantly improve the success of our students: retention rates, graduation rates, degree, and employment opportunities. For example, we know how to improve student retention but do not have the resources for programming and support to make this available to all our students.

We will increase opportunity for our students through hiring new faculty, introducing new courses and degrees in strategic areas for the State, such as Aerospace, Computer, Systems and Biomedical Engineering, and aggressively recruit the best and most diverse cadre of doctoral students. We will attract and retain outstanding faculty in strategic areas of research, and we will provide them with state-of-the-art facilities and staff support to enable them to compete for, and

win, research grants and contracts from government agencies, corporations, and foundations. To do this we need to offer competitive salaries and equipment start-up investments that will be rewarded over the years through external grant funding into the institution, and increased reputation and ranking of our partner universities.

The Joint College is uniquely positioned to develop new and larger research centers that support key areas of technological emphasis, including health technology, materials, aerospace, computer engineering, artificial intelligence, and resilience/sustainability. These research centers will in turn allow the Joint College to expand the size and diversity of its student body and will lead to new intellectual property and spin-off companies in the region.

To meaningfully advance goals related to research, academic quality, overall efficiency and effectiveness of the FAMU-FSU Joint College of Engineering, several critical investments must be made. In 2017, the Legislature provided \$1 million of the \$7.168 million LBR that was requested. That \$1 million was allocated by the College to deal with market equity adjustments to salaries, and to pay salaries for new faculty and staff in the areas of undergraduate and graduate student success. We are grateful for the Legislature's prior support, but the funds requested here are essential in order to meet strategic goals for both FAMU and FSU. This new funding will enable the College to grow to the next level and compensate for nearly a decade of underinvestment.

INVESTMENTS NEEDED TO REACH OUR TARGET OF TOP 20 NATIONALLY RANKED PUBLIC ENGINEERING SCHOOLS (currently #40)

1) Support for Undergraduate Student Success (\$1.353 million)

(Staff \$343,000; programs for student success \$1,010,000)

- a. Retention: To improve the retention rate of students we must provide bridge programs and peer-based tutoring to prepare students for pre-engineering science and math needs and ensure their success.
- b. Successful transfer into major: Almost 50 percent of incoming undergraduates fail to continue on to the major, and transfer to other majors or drop out. Enriching the pre-engineering experience with major-based projects and activities will increase the motivation of students and the successful transfer rate.
- c. Reduce time to degree: Flexibility through the provision of more courses in each semester, and online courses, will reduce the average time to degree and improve the 4-year graduation rate.
- d. Recruiting: additional resources for recruiting will encourage talented and well-prepared students to enroll in the College of Engineering. In addition, we aim to connect with talented high-school students in their

junior year to secure their interest and guide them to make full use of their senior year for pre-engineering preparation.

- e. Internships: internships and co-ops are very attractive to students and employers, and the experiential learning helps students find better higher-paid positions and gives employers better calibration of a potential employee's skills. Strengthening experiential learning will increase the graduation rate and starting salaries of graduates.
- f. These activities require the hiring of four dedicated staff members for advising and mentoring, along with the renovation and equipping of three new laboratories for design projects, and the expansion of online distance learning capabilities.

2) Strengthen graduate student programs (\$641,000)

(Staff \$85,800; additional graduate program needs \$555,200)

Graduate students provide the highly skilled labor for engineering firms in Florida, provide a backbone for in-house research efforts, and leverage the opportunities for undergraduates to engage in research activities. In turn, undergraduate research, a best practice at top engineering schools, exposes engineering undergraduates to exciting "beyond the textbook" experiences that will strengthen their abilities and marketability. Funds will support student fellowships to recruit the best talent and support a staff member to assist in coordination and recruiting.

3) Building programs for increased educational and research impact (\$4.626 million)

(Faculty and Staff \$1,430,000; Faculty Retention \$696,000; Faculty Start-up and Research Equipment \$2,500,000)

We invest in program building through faculty and infrastructure that will advance areas of great strength and/or opportunity for research. The integration of advanced research and graduate education is a prerequisite to offer the top-ranked undergraduate engineering education which includes access to leading edge faculty and research opportunities for undergraduates. Graduate degrees are in themselves important to advance the state's economy. Key programs that we will target for investment are:

- a. **Materials for aerospace:** ultra-light and strong materials are critical to the development of a growing commercial aerospace industry, and to entrepreneurial approaches for efficient high-speed transportation. Through the College, both FAMU and FSU are funded for deep space development, and we have a nationally recognized High-Performance Materials Institute that will become even more competitive in leveraging federal and corporate funding through these enhancements.

- b. **Robotics:** has growing applications to improve manufacturing efficiency, assist loss of function in people, and expand the capabilities of networked devices, popularly known as the “internet of things.” We will strengthen our industry standing through additional expertise and capability in the area of controls expertise within mechanical and electrical engineering.
- c. **Sensors and biomaterials for healthy aging:** (“aging in place”) will require technology for medical devices and sensors that would leverage existing strengths at the College, the FSU School of Medicine and the FAMU College of Pharmacy. The Joint College has a rapidly growing undergraduate bachelor’s degree program in Bioengineering that needs new expertise and capabilities. Growing numbers of Florida undergraduates are exploring the emerging potential of biomedical engineering.
- d. **Resilience and disaster recovery:** our new center in this area connects engineering with other disciplines outside engineering that focus on remediating the impacts of disasters, such as hurricanes and wildfires, and aims to foster resilient communities that can thrive in these challenging conditions. The center promotes all-inclusive and equitable disaster resilience for vulnerable populations and probes the underlying causes of disaster vulnerability in communities. This is done while accounting for infrastructure characteristics and social needs. Their significance is assessed through various computational methods such as machine learning, causality, and regression models.
- e. **High-speed transportation:** our existing Florida Center for Advanced Aeropropulsion is already a leader in the State and the nation for the study of high-speed (from subsonic up to hypersonic) air and space transport. Hypersonics is an area of great importance to national security and to many companies and federal contractors associated with Florida’s aerospace industry. We aim to expand our capability to areas such as combustion and electric aircraft that anticipate future needs of the industry.
- f. **Power systems:** facing the national threats of cyber-attacks, our existing Center for Advanced Power Systems that leads in developing resilient power distributions systems will strengthen efforts in cybersecurity for energy resilience. We would expand on our strength in power systems to design a robust renewable energy “microgrid” and enhance the systems side of renewable energy capture, storage, and transportation.
- g. **Artificial Intelligence (AI) and Deep Learning:** the use of AI is becoming critical in almost all engineering fields, and we aim to build our strength applied to the areas where our research is already strong (including those mentioned above), and to provide advanced courses for engineering undergraduates to make them most desirable to employers. We will work with UF to utilize the Hypergator resources efficiently and effectively.

The recruitment of additional faculty of the highest quality is essential for the Joint College of Engineering to deliver the education and impact needed by the State of Florida, while increasing its reputation to the benefit of graduates and the region. When recruiting faculty, universities **provide “start-up” packages** to attract outstanding researchers, provide the resources they need to succeed in their research, and add to the capabilities of the College in research and education. Packages include funds for equipment, laboratory renovation and for technician support.

Faculty in the College of Engineering embrace the interconnected missions of teaching, research, and service. New faculty and capabilities expand the learning and career opportunities for students and add to the entrepreneurial capabilities in the community and the state.

Faculty continuity and retention are essential to growth of the College. To retain the best and brightest faculty, select faculty salaries must be adjusted to assure retention of those individuals. Using the Oklahoma State University Survey of 114 public research universities, the College of engineering salaries are lower than the average for comparable disciplines, making our best faculty targets for poaching by other institutions.

Because of the unique joint nature of the College of engineering there have been salary inequities between the faculty at the two institutions that must be addressed in order to improve morale. In the 2017-2018 additional allocation from the state, we were able to address immediate inequities. In 2018-19, we used the Joint College funds to offset the inequities, therefore chipping away at our operating budget. The requested additional funds would permit us to continue this process through the following three years. Salary adjustments would not be across the board but would be made based on a review of performance of faculty in teaching and research relative to peers at other institutions.

II. Return on Investment - *Describe the outcome(s) anticipated, dashboard indicator(s) to be improved, or return on investment. Be specific. For example, if this issue focuses on improving retention rates, indicate the current retention rate and the expected increase in the retention rate. Similarly, if the issue focuses on expanding access to academic programs or student services, indicate the current and expected outcomes. University of Distinction proposals should also address the requirements outlined in the separate guidance document.*

These additional resources will allow each of the two universities to improve on several key performance metrics: academic progress rates, graduation rates, production of undergraduate and graduate degrees in areas of strategic emphasis, employment and salary outcomes for students, and metrics related to research and grant production. Specifically:

- a. Increase (by 100 students annually) the number of bachelor’s and advanced degree graduates in the strategic STEM research areas of energy,

- biomedical and computer engineering, environmental sustainability, transportation, and energy, with graduates better prepared for success in industry due to improvements in advanced training.
- b. Significant increases (by 1000 graduates over five years) in the number of degrees awarded in the core engineering disciplines of civil, chemical, biomedical, electrical, computer, industrial and mechanical engineering - all engineering areas of strategic and critical importance to the state.
 - c. Graduates earning higher wages based on their marketability and fit to areas of strategic interest and importance in the engineering profession.
 - d. Improve the research focus and outputs in the form of patents, startup companies and commercialization of research products in the identified strategic areas for the faculty positions.
 - e. Assist the state in diversifying its energy portfolio and meeting its goals with respect to biomedical research, environmental sustainability, aerospace, and robotics.
 - f. Enhance the business climate by attracting companies to Florida with significant research interest in the identified strategic areas - especially companies in the energy and power, materials, space, biomedical, environmental, robotics, and medical devices fields.
 - g. Retain engineers produced in Florida to stay and work for Florida's growing field of technology-based companies.
 - h. Support the state's leading tourism and agricultural industries through additional research and interactions with companies doing business in Florida, by supporting sustainable infrastructure, aging in place, medical devices, and aerospace.

III. Personnel - *Describe personnel hiring and retention plans, making sure to connect both plans to initiative(s) and goal(s) described in section I. State the amount of faculty FTE and staff FTE and estimated funding amounts used for retention and new hires in each category. In describing faculty hires, provide overall hiring goals, including academic area(s) of expertise and anticipated hiring level (e.g. assistant professor, associate professor, full professor. Please describe how funds used for faculty or staff retention will help the institution achieve its stated goals. University of Distinction proposals should clearly note how anticipated hires or retained individuals will help the institution elevate a program or area to national or state excellence.*

Staff for undergraduate student success (advising and mentoring) (Section I.1)

Staff FTE: 4; Salary & Fringe (\$264,000 salary/\$79,000 fringe); Total-\$343,000.

Graduate student program staff for coordination and recruiting (Section I.2)
FTE: 1 Salary & Fringe (\$66,000 salary/\$19,000 fringe); Total-\$85,000

Additional joint college faculty researchers (Section I.3)

Faculty FTE: 8; Salary: \$1.1 million (4 @ \$150,000 and 4 @ \$125,000) plus \$330,000 fringe; Total-\$1.430 million

Faculty will be hired each in the areas justified above under building programs (I.3) a-g.

Retention and vitality of existing faculty (Section I.3)

Salary \$590,000 and \$106,000 fringe; Total - \$696,000

To address market inequities in salary for our existing top faculty performers, magnified by faculty compensation policy differences between our two universities.

IV. Facilities (If this issue requires an expansion or construction of a facility, please complete the following table.): **Not Applicable.**

	Facility Project Title	Fiscal Year	Amount Requested	Priority Number
1.				
2.				



2022-2023 Legislative Budget Request
Education and General
Position and Fiscal Summary
Operating Budget Form II

University: Florida A&M University
Issue Title: Integrated Advancement for the Joint College of Engineering

	RECURRING	NON- RECURRING	TOTAL
<u>Positions</u>			
Faculty	8.00	0.00	8.00
Other (A&P/USPS)	5.00	0.00	5.00
	-----	-----	-----
Total	13.00	0.00	13.00
	=====	=====	=====
Salaries and Benefits	\$1,858,800	\$0	\$1,858,800
Other Personal Services	\$0	\$0	\$0
Expenses	\$0	\$0	\$0
Operating Capital Outlay	\$0	\$0	\$0
Electronic Data Processing	\$0	\$0	\$0
Financial Aid	\$0	\$0	\$0
Special Category (Specific)	\$0	\$0	\$0
Undergraduate Student Success	\$1,010,000	\$0	\$1,010,000
Graduate programs	\$555,200	\$0	\$555,200
Faculty Retention	\$696,000	\$0	\$696,000
Faculty Start-up and Research Equipment	\$2,500,000	\$0	\$2,500,000
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Total All Categories	\$6,620,000	\$0	\$6,620,000
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