State University System
Education and General
2020-2021 Legislative Budget Request
Form I

University(s):	**Florida A&M University and Florida State University**
Issue Title:	**Integrated Advancement for the Joint FAMU-FSU College of Engineering**
Date Issue Approved by University Board of Trustees:	
Recurring Funds Requested:	**$6,511,000**
Non-Recurring Funds Requested:	
Total Funds Requested:	**$6,511,000**
Please check the issue type below:	
Shared Services/System-Wide Issue for Fiscal Year 2020-2021	☐
Unique Issue for Fiscal Year 2020-2021	☐

I. Description

Twenty-seven 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 US 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% females in our undergraduate class. 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 four years since the legislature and partner university leadership recommitted to the joint college, we have seen an increase in most areas by 20% – to a faculty of 119, graduating 500 engineers each year and securing $24M external research funding annually. This growth was fueled by use of carryforward that is now depleted, and the future is jeopardized by the inadequate E&G funding to the college's joint budget. The State University System Board of Governors has identified our $6.5M LBR request as a top

system-wide priority in their 2020-21 budget request. 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 about to become the second university in Florida to reach the top 25 national public universities, yet the college of engineering is only 1/3 the size of the average in the top 25 and must grow to fuel FSU's longer-term advancement in the rankings. And FAMU is already one of the leading HBCUs in research and doctoral degree production, but it also aims to become the first Historically Black University 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 student's 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 provide them with the 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 to the institution.

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, biomedical engineering, computer engineering, and energy 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 joint FAMU-FSU College of Engineering, several critical investments must be made. In 2017, the Legislature provided $1M of the $7.168M LBR that was requested. That $1M 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 support, but the additional funds requested are absolutely more essential now 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.

1) **Additional Joint College Faculty Researchers ($1M Salary + $300K Fringe)**

The recruitment of eight researchers of the highest quality are 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.

a. Faculty in 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 College of Medicine and the FAMU School of Pharmacy.
b. Faculty in 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 new faculty will enable us to seek larger funding opportunities.
c. Faculty in robotics: robotics has growing applications to improve manufacturing efficiency, assist loss of function in people, and expand the capabilities of networked devises, popularly known as the "internet of things." We will strengthen our industry standing through additional hiring in the area of controls expertise within mechanical and electrical engineering.
d. Faculty in biomedical engineering: tissue engineering and synthetic biology are areas that address human health and manufacturing technology. Growing numbers of Florida undergraduates are exploring the emerging potential of biomedical engineering.
e. Faculty in cybersecurity for energy resilience: the development of sustainable energy is vitally important to the state and beyond to the global marketplace. 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.
f. Additional faculty to complement those listed above.

2) **Start-up funds and research equipment for faculty ($2.5M)**

a. Universities must 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.
b. Packages include funds for equipment, laboratory renovation and for technician support. Faculty hires will require an average of $600K each, numbers based on averages of ACC engineering schools shared by the ACC Deans Council. We hope we will be able to keep these costs down, but the packages in engineering will need to be competitive to hire faculty with the desired credentials.
c. Faculty hired in the FAMU-FSU 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 entrepreneurial capabilities in the community and the state.
d. Research activity is essential to the mission of a leading engineering school, and it benefits the students who need access to state-of-the-art tools and ideas. The State benefits from the best trained students, and from the entrepreneurial culture that is fostered. Start-up investments are leveraged many-fold through the external funding attracted by top faculty. Recurring funding is needed to address continuing need for faculty replacement and equipment obsolescence.

3) **Support for (undergraduate) student success ($1.465M)**

a. Salary and Fringe (**$350K Salary + $105K Fringe**)
   i. These activities require the hiring of five dedicated staff members for advising and mentoring.

b. Non-Salary Expenses Related to Student Success **($1,010,000)**
   i. 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.
   ii. Successful transfer into major: almost 50% 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.
   iii. Reduce time to degree: after transferring from pre-engineering the graduation rate is over 70% but the time to graduation on average exceeds four years. Flexibility through the provision of more courses in each semester, and online courses, will reduce the average time to degree and improve the four-year graduation rate.
   iv. Recruiting: additional resources for recruiting will encourage talented and well-prepared students to enroll in the FAMU-FSU 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.
   v. 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.

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.

4) **Strengthen graduate student programs ($550K)**

a. 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.

5) **Retention and Vitality ($590K + 106K Fringe)**

a. Faculty continuity and retention are essential to the growth of the college. In order 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 FAMU-FSU College of Engineering salaries are lower than the average for comparable disciplines, making our best faculty targets for poaching by other institutions.
b. The cost to the State of Florida to replace lost faculty leaders is much higher than retaining existing faculty, since new faculty also require significant start-up investments and their productivity takes a few years to reach full potential because of the disruption in establishing a new research laboratory.
c. Because of the unique joint nature of the FAMU-FSU College of Engineering there are some inequities between the faculty at the two institutions that must be addressed in order to improve morale. In the 2017-18 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 eating away at our operating budget – these additional funds would permit us to continue this process through the following three years.
d. Salary adjustments would not be across the board – adjustments 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

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 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, 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. Facilities

None