

**State University System  
Education and General  
2021-2022  
Legislative Budget Request  
Form I**

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| <b>University(s):</b>  | <b>Florida Polytechnic University</b>   |
| <b>Issue Title:</b>  | <b>Advancing the academic excellence and national stature of Florida Poly, the SUS and the State of Florida</b> |
| <b>Date Issue Approved by University Board of Trustees:</b>        | <b>May 2020</b>   |
| <b>Recurring Funds Requested:</b>                                  | <b>\$2.5 million</b>  |
| <b>Non-Recurring Funds Requested:</b>                              | <b>\$500,000</b>  |
| <b>Total Funds Requested:</b>                                      | <b>\$3 million</b>  |
| <b>Please check the issue type below:</b>                          |   |
| <b>Shared Services/System-Wide Issue for Fiscal Year 2021-2022</b> | <input type="checkbox"/>  |
| <b>Unique Issue for Fiscal Year 2021-2022</b>                      | <input checked="" type="checkbox"/>   |

## I. Overview

This Legislative Budget Request provides a roadmap and funding request for Florida Poly to become an Engineering University of Distinction and to start the climb to becoming a top 10 engineering school without a doctorate degree program. To accomplish this, we will need to focus on **(1) growing student enrollment, (2) improving student success metrics, and (3) becoming a U.S. News and World Report top 10 engineering school without a doctoral program.**

Florida Poly was established as an exclusively STEM university with the explicit goal of accelerating economic development by providing highly capable STEM university graduates for the Florida economy. In a 2019 Economic Impact Study conducted by Dr. Rick Harper of Economic Consulting Services (formerly Director of Economic Development at UWF) commissioned by the Florida Poly's Board of Trustees confirms the state's ingenuity in making its initial investments in this University:

The current annual impact of the University to the Florida economy is calculated to be more than \$161 million in gross domestic product at the local and state level, almost \$98 million in labor income, and more than \$289 million in overall sales, along with 2,350 jobs. This annual impact continues today and will grow with enrollment.<sup>1</sup>

This incremental budget request is critical to provide Florida Poly with the needed resources to continue to increase its impact with new degrees, a long-term increase in student population, and increased recognition

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<sup>1</sup> Harper, Rick. (2019). Assessment of the Economic Impact of Florida Poly. Prepared for: The Florida Polytechnic University Board of Trustees. Economic Consulting Services, Inc. Sept.

and stature as a STEM university.

The Florida Chamber 2030, Florida Council of 100 Project Sunrise and the regional Economic Development Councils agree that strong investments in a talented core STEM (engineering, mathematical and physical sciences) workforce are necessary to continue to grow the high-wage, high-tech economy. The dependency on STEM for industries like aerospace are obvious, but others are less so. For instance, the National Institutes of Health states that some of the biggest gains in healthcare will come not from the life sciences, but from engineering, computer science, and data analysis as applied to health care problems. The finance and insurance industry employ mathematicians and data scientists to make better decisions, as does the logistics industry. Information sciences, driven by Artificial Intelligence (AI), Virtual Reality (VR) and the continued sophistication of the tools of the information age, are pervasive throughout many of the high-tech industries and are critical to growing industry sectors like Autonomous Vehicles, simulation and defense. But as Project Sunrise pointed out, 80,000 high skill jobs in STEM are left unfilled each month, and Florida is not producing enough STEM graduates, ranking only 38<sup>th</sup> in the nation for STEM degree production in spite of being the third most populous state.

This proposal protects the state's already strong investment in the University, which has in six years of operation demonstrated positive benefit for the state. With additional funds strategically allocated, Florida Poly can build on its success and get the boost it needs to more rapidly grow its enrollment, more strongly and efficiently deliver higher progression rates, time-to-degree, and other graduation metrics, and achieve national rankings that continue to contribute to making Florida the envy of all states when it comes to higher education.

Furthermore, this proposal fits squarely in line with the State University System's Strategic plan goals to strengthen the quality and reputation of its programs and Universities, increase degree production and program efficiency, the number of degrees awarded, and grow business throughout Florida. Moreover, it provides additional fuel for the University's own strategic plan that calls for growing degrees in strategic disciplines that grow the Florida economy; maximizing student success through high-impact practices in curricular and co-curricular programming; delivering economic impact through strong industry partnerships in the form of capstone projects, internships, job-placement, collaborative research, tech-transfer, and foremost among these filling the critical high-skill jobs gap; and, finally, delivering maximum value at low cost to students with high return on investment.

Fundamentally, what supports Florida Poly drives the strategic priorities that support a strong Florida economy. This proposal further outlines how that will happen. Toward that end, we seek funding in the amount of \$2.5 million in recurring funds to grow and sustain new, nascent, and existing programs, and \$500,000 in non-recurring funds to provide an initial boost necessary position the right resources for short and long-term impact.

## **A. Drive Enrollment Growth & Quality**

- First-year goal (2022): 1600 students, 300 yearly graduates
- Three-year goals (2024): 1800 students, 325 yearly graduates
- Five-year goals (2026): 2000 students, 375 yearly graduates
- Ten-year goals (2031): 3000 students, 650 yearly graduates

The above numbers show goals for increases in student growth and graduates, but our goals also include growing student quality and diversity as defined by gender, race, and geography. This past fall, almost two-thirds of the incoming class were in the top 25<sup>th</sup> percentile of their high school graduating class. The average SAT for this coming fall freshmen increased by more than 40 points to 1325. Also, for this coming fall, Florida Poly has had the highest percentage increase in applications of all the universities in the SUS. The quality of

Florida Poly's programs is also reflected in the \$54,800 average starting annual salaries earned by our graduates which is the highest in the system.

Studies show that 2 out of 3 Florida high school graduates interested in engineering and with exceptional SAT scores are looking to go to school out of state, possibly because a recent study proved that students learn better in small classrooms at small institutions. Thus, they are not going to big schools out of state like Clemson or Auburn, otherwise they would stay in-state where the price point is better. Rather, it is more likely they are going to places like Rose-Hulman, Olin College, or Harvey Mudd. Florida Poly represents a strong option to retain these highly desirable students in state because we offer that high-touch, uniquely focused experience these students want. There is no small, selective public STEM option for high school students and families serving the State of Florida. Large universities do not fit all learning styles and family preferences, particularly in STEM,<sup>2</sup> and especially for women.<sup>3</sup>

In its first six years of operations, Florida Poly grew quickly to approximately 1250 students and has maintained the student body at this size as it has grown the faculty and put in place degrees and curriculum. This is a result of hard work and sound use of state investment; however, growth at Florida Poly faces a unique challenge because of the University's newness. Universities that have been in place for decades rely on their inherent "name recognition" and the accomplishments of their graduates to propel their admissions process. While Florida Poly is positioned to grow and has the capacity to grow quickly (in terms of the number of students that it serves), Florida Poly must rely on other tactics to matriculate students to the university until it grows its reputation and acquires appropriate status as a top 10 engineering school.

### **1. STEM Tech Days**

Florida Poly plans to expand its Stem Tech Days which bring entire classes of high school seniors to campus who are enrolled in their school's calculus, physics, and technology classes, for a day of applied STEM learning. Initial results of this program have shown it to be effective in recruiting top performing students who have shown an interest in STEM careers. It also serves as a means of increasing the STEM pipeline for tech companies that need top tech talent to fill vacant positions and grow.

### **2. Transfer Concierge Program**

A personalized transfer program provides greater access to students from the State College System by working with each transfer student to ensure that they get maximum academic credit for courses they completed at the state college. This approach shortens the time to degree for these students while also saving them money as a result of being enrolled at Florida Poly for fewer semesters. This program builds on an expanding effort toward transfer and articulation agreements and other initiatives through staff training and support.

### **3. The 67% Scholarship Initiative**

Florida Poly attracts and admits the top academic students from throughout Florida. These students are in high demand, low supply fields and therefore have variety of choices for where they can matriculate. Because they are in such high demand by top tier engineering programs around the country, they are offered significant scholarship packages. Frequently they are enticed to leave their home state of Florida and are not available to fill positions here. Although Florida Poly prioritizes funding scholarships to the best students in the state, additional scholarship funds are needed to keep the best and brightest students in Florida.

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<sup>2</sup> Orzel, C. (2015) Why small colleges are great for science students" FORBES. Apr 10, 2015.

<sup>3</sup> Ballen, C. J., Aguillon, S. M., et al (2019). Smaller classes promote equitable student participation in STEM. *Bioscience*, 69(8), 669-680.

Some of these top students come from families that have very limited ability to meet the financial needs of their children to attend a university. Therefore, providing competitive scholarships to them is a key component of convincing them to remain in Florida for their college education.

This program is intended to chip away at the 2/3 (67%) of Florida's brightest future engineers who leave the state for other, small engineering schools.

#### **4. Leadership in Calculus Program**

Florida Poly has also developed a mathematics support initiative to serve underrepresented populations. Calculus is one of the biggest hurdles for engineering students across the SUS to graduate from their programs. Current Florida Poly students who have taken Calculus 2 or Calculus 3 will serve as tutors for high school seniors taking high level math. The high school students will be better prepared for the intense math required once they enter the University's engineering programs. These students are then more likely to enroll in an engineering program and graduate. This program facilitates stronger ties between the University and communities throughout Florida as well.

#### **5. New Degree Programs and Curricula**

A key for growing the enrollment at Florida Poly is adding degree programs in high demand fields. One such degree field is Civil Engineering. Demand for engineers generally will continue to increase with projected population growth. Florida's population is projected to grow at a higher rate than any other southeastern state (35.3% by 2030). This expansion likely will result in the need for more infrastructure enhancements requiring a strong workforce of civil engineers (Florida Transportation Commission Florida Department of Transportation Management Compensation Study). In consideration of the state's continuous need for transportation maintenance, repairs, and construction, and the growing population and prominent tourism industry, transportation officials can expect an increasing need to attract and retain quality civil engineers to maintain the state's infrastructure (Florida Transportation Commission Florida Department of Transportation Management Compensation Study).

## **B. Improve Student Success Metrics**

- First-year goal (2022): 80% APR, 40% 4-year graduation rate
- Three-year goals (2024): 83% APR, 41% 4-year graduation rate
- Five-year goals (2026): 85% APR, 43% 4-year graduation rate
- Ten-year goals (2031): 90% APR, 55% 4-year graduation rate

Over the last two academic years in particular, the University has made an aggressive push in the form of policy and practice to advance its student success metrics. Programs such as early alert, which utilizes the learning management system where faculty can easily alert the Academic Success Center and other campus Resource Centers to a student a student who might be struggling has had a direct impact on the University's ability to deliver services to students in a timely, effective way. Instructional efforts to encourage meaningful feedback early in the term and more transparent grading have helped students and academic coaches be more aware of their progress. The Academic Success Center has worked diligently to track at-risk students and has through one program reduced the number of students who were entering fall term below a 2.0 by 65%. Despite these positive indicators, without additional financial support, our ability to sustain this level of continuous improvement is at risk, particularly, as we grow enrollment. Spending on student support is linked to increased graduation rates and evidence shows that one-on-one guidance, academic intrusive advisement, and support can promote college completion.<sup>4</sup>

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<sup>4</sup> Deming and Walters (2017). The Impacts of Price and Spending Subsidies on U.S. Postsecondary Attainment.

## **1. Student Tracking/Degree Audit System**

One of the most significant metrics for any university is the graduation rate for its students. Key to increasing the graduation rate of students is keeping them enrolled and progressing through their program of study. National research and reports demonstrate that students are lost along the educational STEM path; these reports emphasize the students' crucial first term on campus and the summer after their first year of study as crucial periods for persistence (National Academy of Sciences, 2010)<sup>5</sup>. Tracking student progression and having support programs in place for students who falter are extremely important. Florida Poly plans to purchase a student progression tracking system, such as a degree-audit system, that will allow our faculty and various student support professionals to know which students are falling behind (for a variety of reasons) and bring to bear the appropriate support services early on in the academic career of the students. If we can identify problems early-on we can reduce the rate at which some students fall behind in completing their programs in an acceptable time period or not at all.

## **2. Phoenix First-Year (First-Year Experience) Program**

Leaving home to attend college is difficult for most students. If you add to that challenge the difficulty of the academic programs at Florida Poly, it is understandable why the first year of their college careers is very challenging. The University will enhance the first-year experience of our students by hiring experts who can focus on helping those first-year students navigate that very difficult transition and maintain their academic focus. This program complements our curricular common freshman and core academic foundations sequence by expanding it to the more holistic look at the student life experience as it extends to health, wellness, career, and what it means to become a Florida Poly Phoenix.

## **3. Hand-to-Hand Calculus Program**

The University proposes to implement a Calculus Initiative that leads to more effective methods for teaching calculus. Because this is such a universal stumbling block for engineering students the proposal is to bring top tier faculty to the University to collaborate on finding improved methodologies for teaching calculus. Success will lead to improved student progression and graduation rates. Results of the effort will be shared with our sister institutions which will have a significant positive impact at Florida Poly and throughout the state.

The initiative will also include a student peer-to-peer component. Academic programs at Florida Poly require two or three semesters of calculus. Like engineering programs across the nation, many students at Florida Poly who are unable to complete their engineering degree are stymied by calculus. The University proposes to expand its STEM peer tutoring and mentoring program. Students taking calculus 3 will serve as tutors for students taking calculus 1. Two benefits are obtained with this arrangement. The calculus 1 student receives much needed academic help with learning calculus 1. This ensures that they are prepared for the courses that follow for which a good understanding of calculus is critical. In addition, the calculus 3 student gets more practice with calculus basics and obtains experience in training someone else, specifically with explaining difficult concepts to others, a critical professional skill particularly for engineers and all STEM professionals. This program capitalizes on the admissions-related Leadership in Calculus program.

## **4. Phoenix Flight (Enhanced Co-curricular Professional Development) Program**

Florida Poly has a range of programs, services, and requirements that require additional resources to synergize into a strongly cohesive undergraduate professional development program. These activities

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<sup>5</sup> National Academy of Sciences, Institute of Medicine, & National Academy of Engineering. (2010). *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5*.

include curricular requirements such as internships; services such as Career Services Center; entrepreneurial clubs, competitions, opportunities and classes; leadership programs; student employee training; and so on. Our educational vision includes the idea that graduates will be able to step into major projects on day one of their new job and successfully integrate into the team and add value immediately. By bringing together these opportunities into a coherent framework to support students' sense of themselves as emerging practitioners and professionals will ensure we deliver high quality graduates to the Florida marketplace and boost the Florida economy.

## C. Achieve National Rankings

- First-year goal (2022): Entrance into USNWR Engineering Colleges without Doctoral Program
- Three-year goals (2024): Top 25 USNWR Engineering Colleges without Doctoral Program
- Five-year goals (2026): Top 15 USNWR Engineering Colleges without Doctoral Program
- Ten-year goals (2031): Top 10 USNWR Engineering Colleges without Doctoral Program

The vision for the university is to be an upper-tier engineering school for the state of Florida, and we have made great progress towards that vision in just six years. As a young university, we are already attracting highly distinguished students from across the state, and we have built a strong curriculum around nine engineering and related programs. We built strong relationships with over 200 technology companies and are providing them with a talented workforce. Becoming a highly ranked engineering university will also require that Florida Poly faculty heavily engage and collaborate with top tier faculty from around the nation and world. These partnerships will expose our faculty to their peers with whom they can form partnerships and conduct joint research and establish joint programs that will benefit our students and the state's economy.

This Legislative Budget Request provides a roadmap and funding request for Florida Poly to become an Engineering University of Distinction and to start the climb to becoming a top 10 engineering school without a doctorate degree program. To accomplish this, we will need to focus on growing our students, faculty, curriculum and support services.

## II. Return on Investment

- ROI Metric 1 - At least \$161 million in gross domestic product at the local and state level.
- ROI Metric 2 - Annual increase the percentage of engineering graduates supplied to the workforce

Since our first graduates in 2017, our unique curriculum with small classes has produced graduates that are both lifetime employable and ready for the workforce. Florida Poly engineering graduates complete their degree in four years at a rate that is 30% better than the next highest college of engineering in the system, and 42% higher than the average across the system. Seventy percent of our students graduate without excess hours and our average cost to the student is nearly \$8,000 less than that for the University of Florida. But these important statistics should not surprise anyone because recent empirical evidence proves that students studying STEM at small institutions are much more successful than those at large institutions.

And we are seeing evidence of that: the median wages of our first graduating class was \$54,800, and last year alone, Florida Poly grew the Florida GDP by \$161M and added \$98M in labor income to our economy. Our students have a return on their college education that is more than three times larger than the average across the system. Growing the university to a student body of 2000 should increase the GDP annually by \$23.5 million due to university operations, capital expenditures and student spending alone. Increasing the graduates to 400 will have significantly more impact since most of the \$161 million annual increase in GDP comes from Present Value lifetime earnings from these high-paying fields.<sup>6</sup>

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<sup>6</sup> See Harper, Rick. (2019).

# Metrics and Goals Summary

## *Year-One Accomplishment Metrics (2022):*

1. Entrance into USNWR Engineering Colleges without Doctoral Program
2. 1600 students
3. 300 yearly graduates
4. 80% APR
5. 40% 4-year graduation rate
6. Target a reduction in DFW rate for MAC 2311 - Analytic Geometry and Calculus 1 by 7% each fall term (until rate falls to approximately 17%)

## *Three-year goals (2024)*

1. Top 25 USNWR Engineering Colleges without Doctoral Program
2. 1800 students
3. 325 yearly graduates
4. 83% APR
5. 41% 4-year graduation rate
6. Monitor Calculus DFW rates (should be at target levels by this point)

## *Five-year goals (2026)*

1. Top 15 USNWR Engineering Colleges without Doctoral Program
2. 2000 students
3. 375 yearly graduates
4. 85% APR
5. 43% 4-year graduation rate
6. Monitor Calculus DFW rates (at or below peer targets for small engineering Colleges/Universities)

## *Ten-year goals (2031)*

1. Top 10 USNWR Engineering Colleges without Doctoral Program
2. 3000 students
3. 650 yearly graduates
4. 90% APR
5. 55% 4-year graduation rate
6. Monitor Calculus DFW rates (at or below peer targets for small engineering Colleges/Universities)

## *Return on Investment*

1. ROI Metric 1 - At least \$161 million in gross domestic product at the local and state level.
2. ROI Metric 2 - Annual increase the percentage of engineering graduates supplied to the workforce

**2021-2022 Legislative Budget Request  
Education and General  
Position and Fiscal Summary  
Operating Budget Form II  
(to be completed for each issue)**

**University:** Florida Polytechnic University  
**Issue Title:** Advancing the academic  
excellence and national stature  
of Florida Poly, the SUS and  
the State of Florida

|                             | <u>RECURRING</u> | <u>NON-<br/>RECURRING</u> | <u>TOTAL</u> |
|-----------------------------|------------------|---------------------------|--------------|
| <u>Positions</u>            |                  |                           |              |
| Faculty                     | 5.00             | 0.00                      | 5.00         |
| Other (A&P/USPS)            | 6.00             | 0.00                      | 6.00         |
|                             | -----            | -----                     | -----        |
| Total                       | 11.00            | 0.00                      | 11.00        |
|                             | =====            | =====                     | =====        |
| Salaries and Benefits       | \$1,230,800      | \$0                       | \$1,230,800  |
| Other Personal Services     | \$105,000        | \$0                       | \$105,000    |
| Expenses                    | \$174,200        | \$500,000                 | \$674,200    |
| Operating Capital Outlay    | \$135,000        | \$0                       | \$135,000    |
| Electronic Data Processing  | \$105,000        | \$0                       | \$105,000    |
| Financial Aid               | \$750,000        | \$0                       | \$750,000    |
| Special Category (Specific) | \$0              | \$0                       | \$0          |
|                             | \$0              | \$0                       | \$0          |
|                             | \$0              | \$0                       | \$0          |
|                             | \$0              | \$0                       | \$0          |
|                             | -----            | -----                     | -----        |
| Total All Categories        | \$2,500,000      | \$500,000                 | \$3,000,000  |
|                             | =====            | =====                     | =====        |