Board of Trustees Special Meeting

Board of Trustees

Jun 30, 2021 9:00 AM - 10:00 AM EDT

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UNIVERSITY OF CENTRAL FLORIDA

Board of Trustees Special Meeting
June 30, 2021
Virtual Meeting
9:00 – 10:00 a.m.
Zoom link:
https://ucf.zoom.us/j/92279090572?pwd=U0RGYU5QUGlRS1pLUUZqYlRDSXRTdz09
Meeting ID, 922 7909 0572
Conference call number, 1-929-205-6099

AGENDA

1.	Welcome and Call to Order		Beverly Seay, *Chair, UCF Board of Trustees*
2.	Roll Call		Karen Monteleone, *Assistant Vice President, Board Relations*
3.	Public Comment		Karen Monteleone
4.	New Business		Chair Seay
	BOT – 1	Motion	UCF Legislative Budget Requests Alexander Cartwright, *President* Michael Johnson, *Interim Provost and Vice President for Academic Affairs*
	BOT – 2	Motion	Heating, Ventilation and Air Conditioning (HVAC) Renovation Projects Gerald Hector, *Senior Vice President for Administration and Finance* Duane Siemen, *Assistant Vice President, Facilities Operations*
	BOT – 3	Motion	Amended Five-Year Capital Improvement Plan FY 2022-23 through FY 2026-27 Gerald Hector Duane Siemen Bill Martin, *Senior Director, Facilities Planning and Construction*
5.	Adjournment		Chair Seay

ITEM: BOT-1

UCF BOARD OF TRUSTEES
Agenda Item Summary
June 30, 2021

Title: UCF Legislative Budget Requests

☐ **Information** ☐ **Information for upcoming action** ☒ **Action**

Meeting Date for Upcoming Action: _____

Purpose and Issues to be Considered:
Review and consider approval of UCF's four Legislative Budget Requests for the 2022 state legislative session.

LBR #1: "UCF Powering-Up Florida's High-Tech Economy" $21,811,200
Building on UCF's existing strengths, UCF's University of Distinction LBR identifies the College of Engineering and Computer Science (CECS) as a core unit within the institution to reach higher levels of national excellence. This proposal seeks funding to: increase the number of engineers and computer scientists needed to fuel Florida's growth in the high tech sector; provide targeted, cross-cutting education and research training to UCF students, enhancing the talent that Florida's high-tech industry needs for innovation; expand partnerships with high tech industries in Florida, enhancing Florida's economic prosperity; improve UCF's student:faculty ratio with the addition of 64 new faculty positions, and improve CECS undergraduate and graduate program rankings, thus enhancing UCF's national reputation.

LBR #2: Advancing Medical Education and Healthcare in Central Florida $5,000,000
UCF requests a recurring state appropriation of $5,000,000 for the UCF College of Medicine. Expansion of base funding is critical to ensuring the success of UCF's College of Medicine while also ensuring its ability to serve the people of Central Florida. With additional recurring funds, UCF will enhance the delivery of a dynamic medical school curriculum that includes students, residents, and fellows who will meet the needs of Florida's increasingly diverse and aging population. The increase in funding will provide opportunities to increase the number of trained physicians who stay in Florida, improve public heath, address healthcare disparities, and expand interdisciplinary research that links healthcare with UCF's strengths in engineering, optics, and modeling and simulation. These outcomes will increase partnerships that expand the economic impact of Medical City, a destination focused on global excellence in medical education, research, and patient care.

LBR #3: UCF PTSD Clinic for Florida Veterans and First Responders $515,000
In the last year alone, UCF's PTSD Clinic, known as RESTORES, completed over 4,000 hours of therapy for Florida's veterans, first responders and survivors of mass violence at no cost to the participants. As a result of the COVID-19 pandemic, the volume of requests from the first responder community increased. This funding request is to cover services at our Orlando clinic. It includes salaries and fringe benefits for 4 masters level therapists, 1 care coordinator, 1 business specialist, 1 program manager, 1 resiliency training coordinator, and 2 outreach personnel. It also includes all operational costs for the clinic including electronic health record costs, maintenance of computers, printers, virtual reality equipment, consumable supplies such as diagnostic assessment materials, patient workbooks needed for treatment sessions, copy paper, telephone, etc.

LBR #4: Lou Frey Institute **$976,000**

The Civic Renewal Initiative of Governor DeSantis and Education Commissioner Corcoran offers the opportunity to expand the work of UCF's Lou Frey Institute (LFI) to include the state's 70,000 elementary teachers as well as thousands of secondary U.S. History and Government teachers.

With this requested funding, LFI would accomplish the following:

- The Initiative calls for a review and revision of Florida's instructional standards and benchmarks for K-12 civics instruction. As revisions are completed, LFI will undertake a revision of its existing online instructional materials and student learning materials to align with revised instructional goals. In addition, selected new components will need to be developed to be consistent with state policy initiatives in civics.
- LFI will coordinate with UCF's College of Community Innovation and Education to improve civic learning opportunities for students in need throughout the Orlando region.
- LFI will expand online and face-to-face professional development opportunities to support educator needs in new standards and benchmark implementation in every district in the state.
- LFI proposes to add data management and analysis personnel that would support continuous monitoring of its activities with regular reports to the state's civic education community. We anticipate an advisory structure that would engage districts, Florida Department of Education assessment personnel, and research colleagues from other state universities in this effort.

Background Information:

The Board of Governors (BOG) has issued instructions to the universities to submit fiscal year 2022-2023 Legislative Budget Requests (LBRs) by July 9, 2021. The BOG will collect submissions from the universities to create its LBR for the State University System which will be focused on the Pillars of Excellence initiative, which includes the following three "Pillars:"

- Performance-based funding
- Preeminence / National Ranking (UF, FSU & USF), and
- University of Distinction.

The amount to be requested for each Pillar will be determined by the BOG, and UCF is required to submit a request under the University of Distinction program.

University of Distinction Proposal

The BOG has instructed state universities submitting University of Distinction proposals to:

a. Focus on one core competency unique to the State University System that achieves excellence at the national or state level, meets state workforce needs, and fosters an innovation economy that focuses on areas such as health care, security, transportation, and science, technology, engineering, and mathematics (STEM), including supply chain management.
b. Provide detailed information on how faculty recruitment and hiring and retention initiatives support plans to achieve national and state excellence.
c. Submit the same area of distinction as previously submitted for 2021-2022.

University Specific Proposals

Universities are also permitted to submit Legislative Budget Requests (LBRs) for university-specific initiatives that will not be included in the BOG's system request. The BOG instructions state that a university pursuing university-specific budget requests should also complete the BOG forms for each request and submit them to the BOG as information items. The BOG takes no formal action on university specific LBRs.

Recommended Action:
Approve UCF's legislative budget requests as proposed.

Alternatives to Decision:
The University of Central Florida's legislative budget requests are required to be submitted to the Board of Governors on July 1, 2021. If a university should choose not to submit a University of Distinction LBR, no funding will be included for that university in the BOG's request for the State University System, except for the university's share of performance funds.

Fiscal Impact and Source of Funding:
Attached proposals are a request for additional state funding.

Authority for Board of Trustees Action:
Section 1001.706(4)(b), Florida Statutes: The Board of Governors shall prepare the legislative budget requests for the State University System, including a request for fixed capital outlay, and submit them to the State Board of Education for inclusion in the K-20 legislative budget request. The Board of Governors shall provide the state universities with fiscal policy guidelines, formats, and instruction for the development of individual university budget requests.
Section 1001.7065 (7), Florida Statutes: The Board of Governors shall establish standards and measures whereby state universities that focus on one core competency unique to the State University System that achieves excellence at the national or state level, meets state workforce needs, and fosters an innovation economy that focuses on areas such as health care, security, transportation, and science, technology, engineering, and mathematics (STEM), including supply chain management, can be identified. The Board of Governors may annually submit such programs, excluding those from preeminent state research universities to the Legislature by January 1 for funding.
Board of Governors Regulation 1.001 University Board of Trustees Powers and Duties (6) Financial Management: (a) Each board of trustees shall be responsible for the financial management of its university and shall submit an institutional budget request, including a request for fixed capital outlay, and an operating budget to the Board of Governors for approval in accordance with the guidelines established by the Board of Governors.

Contract Reviewed/Approved by General Counsel ☐ **N/A** ☒

Committee Chair or Chair of the Board has approved adding this item to the agenda ☒

Submitted by:
Michael Johnson, Interim Provost and Vice President for Academic Affairs

Supporting Documentation:
Attachment A: UCF Powering Up Florida's High-Tech Economy
Attachment B: Advancing Medical Education and Healthcare in Central Florida
Attachment C: UCF RESTORES PTSD Clinic LBR Forms I & II
Attachment D: UCF Lou Frey Institute

Facilitators/Presenters:
Michael Johnson, Interim Provost and Vice President for Academic Affairs

Attachment A
State University System
Education and General
2022-2023 Legislative Budget Request.
Form I

University(s):	**University of Central Florida**
Request Title:	**UCF Powering Up Florida's High Tech Economy**
Date Request Approved by University Board of Trustees:	
Recurring Funds Requested:	**$18,811,200**
Non-Recurring Funds Requested:	**$ 3,000,000**
Total Funds Requested:	**$21,811,200**
Please check the request type below:	**University of Distinction Request**
Shared Services/System-Wide Request	☐
Unique Request	☐

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.*

1.1. Overall Purpose of the Plan:

UCF's research enterprise and graduates are key drivers of Florida's high tech economy. This plan seeks to boost our ability to power up the high tech economy by building on existing strengths, targeting emerging transdisciplinary solutions to common, multi-business sector regional and national needs. The proposed overall plan has two overarching goals:

A: *Enhance Research, Educational Excellence and Industry Partnerships*: UCF will enhance and expand existing strengths to become the research and development partner of choice for Florida's high tech sector through strengthening UCF's partnerships in the areas of aviation, space, energy and entertainment that are core business foci of thriving industry sectors in Florida; building upon UCF's research excellence in enabling technologies, that drive technological advances in these application areas, such as AI/ML, AR-VR-MR, cyber security, space sciences and engineering, power systems, modeling and simulation and themed experiences; strengthening UCF's partnerships with defense agencies and

supported industries, mostly located in UCF's Research Park, comprising a strong modeling, simulation and training community that earned Central Florida's status as the Center of Excellence in Modeling and Simulation; delivering impactful research that is cross-cutting, synergistic and applicable across multiple business sectors that span a wider spectrum of business needs in aviation, space, energy, defense, entertainment, and themed experience.

B: *Enhance Student Success*: UCF will increase the quantity, quality and diversity of the STEM talent, including engineers and computer scientists and the critically needed creative talent, who graduate with experience in working collaboratively in teams and across disciplines. This initiative is in direct response to the needs and requests of the high tech sector and is critical to sustain and expand Florida's innovation economy.

To accomplish this plan, new resources are requested through this LBR to accompany already existing resources at the University of Central Florida.

Industry Needs in the US, Industry Strengths in Central Florida:

According to the Florida Council of 100's *Project Sunrise* report "each month, an average of 80,000 high-skilled and 30,000 middle-skilled jobs are left unfilled." By 2025, there will be two million unfilled jobs in manufacturing in the US ([1]US News, March 27, 2018). The need for workforce talent in computing areas is equally significant. According to the Bureau of Labor Statistics[2], "Employment of computer and information technology occupations is projected to grow 12 percent from 2018 to 2028, much faster than the average for all occupations. These occupations are projected to add about 546,200 new jobs.

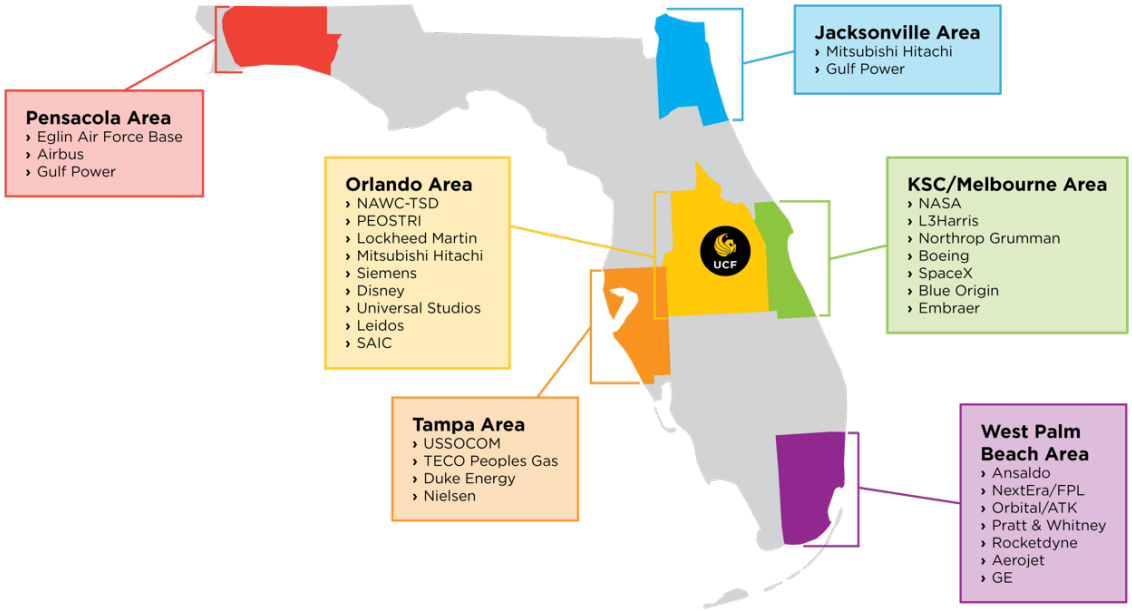

Figure 1: A diagram with Florida companies and their respective locations in the State of Florida. These companies have core business areas in the areas of Aviation, Space and Energy. UCF proposes to provide the fundamental technologies such as Artificial Intelligence, Machine Learning, Augmented Reality, Virtual Reality, Cyber Security, Hypersonics, Power Systems, Advanced Manufacturing and Space Sciences and Engineering to power up the well-being of these industries that contribute to the economic prosperity of the State.

With ever greater urgency, industries will require a highly educated, high-quality, talented and creative supply of talent, ready to join a rapidly expanding STEM sector in and around Central Florida and the state. The aviation and defense industries along with the power industry in Central Florida are thriving and well-diversified. They conduct R&D tailored programs and have growing demands for highly skilled workers, fueling our economic engine and impacting business in nearly all 23 counties [floridahightech.com[3]].

A number of large industries in the state, such as Lockheed Martin, L3Harris, Northrop Grumman, as well as the entertainment giants, such as Disney and Universal reside in Central Florida and are close to UCF campus [Figure 1]. Similarly, two of three major global manufacturers, Siemens and Mitsubishi are located in Orlando and two of top five US utility companies, NextEra (FPL) and Duke, have a strong presence in Florida. These companies employ tens of thousands of employees, many of whom are UCF graduates who help to propel the state's high tech economy. The space industry is booming on Florida's east coast, involving space companies such as Boeing, Space X, Blue Origin, all with strong presence on NASA KSC's campus, a short driving distance from UCF's main campus.

In addition to being close to the aviation, space and energy industries and government organizations, UCF is located at the center of the international hub of the themed entertainment industry. Seven of the top twelve attended themed parks and four of the top five waterparks worldwide are in Orlando[4]. Appropriately, most of the leading themed entertainment firms have significant presence in Orlando including Universal Creative, SeaWorld Deep Blue Creative, and Hershend Entertainment. These industries need creative, innovative and technologically competent talent. The enabling technologies at the center of this initiative and the synergistic collaboration of three UCF colleges to stand up an encompassing themed experiences curriculum will meet this need.

Figure 2 below, provides a holistic view of industry's and government's technological needs that UCF intends to serve through this LBR. These needs, as emphasized above, will be served by (A) delivering impactful research that is cross-cutting, synergistic and applicable across multiple business sectors and (B) producing a talent pipeline that is creative, innovative and technologically competent in enabling technologies that are cross-cutting and synergistic.

Figure 2: Cross-cutting and synergistic business sectors that UCF will serve through this LBR.

UCF's Strengths and Industry Partnerships:

UCF is a major metropolitan university whose existing research infrastructure and student success are well-suited to support the technical challenges of the industry in the areas of aviation, space and energy. UCF's fundamental technology know-how and research infrastructure that supports aviation, space and energy-related research, in conjunction with the strong presence of related industries, are the appropriate elements of an ecosystem that promises sustained excellence and growth. Our strengths in aviation, space and energy and technologies that fuel the success in these areas are illustrated by successful centers of excellence (energy, computer vision), clusters (cyber) and specialized academic programs (computer vision, cyber security, data analytics, AR/VR/MR, themed experiences). Other areas of UCF strength are evident by the strong faculty groups in AI/ML, AR/VR/MR that span expertise in multiple colleges/units, including the College of Engineering and Computer Science.

A testament of UCF's strength in the areas of focus for this LBR is that, according to Aviation Week, UCF has been named the No. 1 producer of graduates for the aerospace and defense industries (6 years in a row), while also enjoying a #2 national ranking for graduates with the skills most desired by employers in these industries. Another testament of UCF's strengths are the many multi-partner (involving industry and academia) funded contracts and grants in the aviation, space and energy areas. This requested investment will expand the diversity and strength of UCF's educational and research portfolio in these focal application areas and intensify the partnerships with the many related industries, most of them located in UCF's vicinity (See Figure 1). More than any other university, UCF is poised to maintain its stature as a dominant supplier of talented, highly compensated engineers for the aerospace and defense industries, as well as other industries and government agencies in Florida. More than any other University, UCF is poised to expand its partnerships with aviation, space, energy and defense companies that would advance the state of the art in technologies that impact the economic prosperity of these industries and thereby, the State of Florida.

Our research strengths that impact industries with focus in AI/ML, AR/VR/MR, aviation, space, energy and defense include but are not limited to rocket propulsion, hypersonic systems, technologies that deploy telescopes and satellites, Artificial Intelligence/Machine Learning augmented SSA (Space Situation Awareness) algorithms, high temperature durability of materials, turbomachinery, power systems and smart grid, and lunar and asteroid surface science. UCF has key infrastructure labs to conduct research in these areas and its faculty have published widely in high-impact publication venues. In all, UCF has garnered nearly $200M in external research funding in each of the last three years, has had 40+ years of partnership with Lockheed Martin and 30+ years of partnership with Siemens.

Orlando is the technological hub for modeling, simulation and training through cutting edge research in artificial intelligence, machine learning, computer vision, virtual and mixed reality. UCF's Research Park is a unique collaborative alliance formed by simulation and training R&D and acquisition commands, UCF, and a vibrant modeling and simulation industry boasting 100+ companies. The US Department of Defense in UCF's Research Park provides $6B in contracts annually to companies in UCF's vicinity as well as other companies nationwide. The state is significantly vested to sustain and enhance the status of Central Florida as the nationwide location of excellence in modeling and simulation and has invested in five Partnership buildings that co-house the military, the renowned UCF Institute for Simulation

and Training and the National Center for Simulation (representing 250+ companies). UCF's research strengths that fuel the region's excellence in modeling and simulation and support industries that focus on aviation, space and energy also lend themselves to cross-cutting application focal areas.

An example of a cross-cutting application focus is Digital Twin. Digital Twin is a digital replica of a physical object such as an aircraft engine or a transportation system[5]. It can be a digital reproduction of any system, from humans, to manufacturing processes, to transportation systems, to aviation, space systems, to power plants, and the list of possibilities is endless. A physical twin that is replicated on a virtual platform is a near-real-time digitized copy of a physical object. It is a bridge between the digital world and the physical world. Manufacturers are finding that this concept will reduce the development costs of the next generation of machines by well over 50 percent.

Digital Twin is of interest to all industries of focus in this LBR (aviation, space, energy, DoD entities and industries in UCF's Research Park including the prominent entertainment industry, such as Disney and Universal, located in UCF's backyard). Digital Twin can draw from UCF's strengths in the fundamental technologies that support this area such as aerospace and space science and engineering, AI/ML, AR/VR/MR, transportation science and technology to mention a few.

A *Digital Twin* must "*age*" at the same time as the *Physical Twin* does. Since such engineered systems are based on complex laws of physical sciences and engineering principles, development of digital twin must be accompanied by corresponding physical testing, thus establishing a feedback loop among models, sensors, and test data. The Digital Twin concept offers the opportunity of a cross-cutting technology that span the expertise of multiple UCF colleges/units and creates new opportunities of expanding the partnerships with our leading industries in the region (Space (NASA, SpaceX, ULA, Blue Origin, L3Harris), Defense (LM, L3Harris, Raytheon), Government (DoD, NASA), Energy (Siemens, Mitsubishi), Entertainment (WDW, Universal, EA)), towards a common technology focus, that of Digital Twin. The capabilities that a Digital Twin focus will afford, if applied across all industries and systems, are beyond anything available today and will put Orlando/UCF/related industries on the national forefront as the primary developers and implementers of this concept. An investment of the magnitude that this LBR requests will accelerate the realization of this Digital Twin vision.

1.2 Program Goals, LBR Request

UCF has identified the College of Engineering and Computer Science (CECS) as a core unit within the institution to reach higher levels of national excellence. CECS has a number of programs under its umbrella, such as Civil, Environmental and Construction, Computer Science, Electrical and Computer Engineering, Industrial Engineering and Management Systems, Mechanical and Aerospace Engineering and Materials Sciences and Engineering, which serve to fuel the pipeline of workers with science, technology, engineering and math skills.

This proposal seeks funding to: provide targeted, cross-cutting education and research training to UCF students, thus enhancing the talent pipeline that Florida's high-tech industry needs; expand partnerships with high tech industries in Florida, thus enhancing the State's economic

prosperity; improve CECS undergraduate and graduate program rankings, thus enhancing UCF's national reputation. The specific LBR has two goals, as articulated earlier and expanded below.

- **Goal A (*Enhance Research and Educational Excellence/ Industry Partnerships*) –** To enhance the research and educational excellence, as well as industry partnerships, UCF proposes to hire faculty and support personnel, support student assistants, and support faculty start-up costs as well as lab upgrades. These new faculty hires will offer additional sections of courses in the high demand STEM areas, thus ensuring a larger and more competent STEM pipeline for Florida's industry. Furthermore, these faculty will expand the research portfolio of the institution (enhancing its national reputation) and partnerships with industries (fueling economic prosperity) in the key application areas of aviation, space and energy. Finally, these faculty will expand the partnerships with key industries and government entities that focus on modeling, simulation and training (Central Florida is already recognized by the state as a Center of Excellence in modeling, simulation and training). Attaining this goal will enhance the College's and UCF's national and international stature.
- **Goal B (Enhance Student Success):** To increase the capacity of programs that recruit, sustain and graduate a diverse STEM student population at high rates by focusing on STEM learning communities and early engagement in undergraduate research experiences, as well as programs that improve the math placement status of the incoming diverse FTIC thus enhancing their 4-year graduation rates. The College of Engineering and Computer Science is already ranked high (18th in the nation in the total number of degrees, and 3rd in the nation in the number of degrees to underrepresented minorities). Attaining this goal will propagate the College's stature at higher national ranking levels.

The cost of this LBR request amounts to: $14.8M recurring (64 faculty hires), $2M recurring (support personnel), $2M recurring (support for student assistants), $2M recurring (support of programs that enhance the quantity, quality and diversity of the STEM pipeline), $3M non-recurring (start-up support and lab upgrades), a total request of $21.8M ($18.8M recurring funds and $3M of non-recurring funds). These funds will target strategic areas of opportunity to further enhance UCF's pursuit of academic and research excellence as a Florida University of Distinction. This LBR request and related goals are in line with *UCF's 2021 Accountability Plan* to be one of the nation's leading metropolitan research university (Goal A) with a strong focus on student success (Goal B).

The College of Engineering and Computer Science has an obligation to our community and an opportunity to prepare our students and the next generation employees in future technologies. If UCF's LBR is funded, it would place the State of Florida in an enviable position by not only elevating the national stature of one of its universities but supporting the thriving aviation, space and energy industry in the State of Florida in ways that will lead to higher economic prosperity. Already recognized as one of the largest universities in the nation, this LBR also provides an opportunity for UCF to achieve high national ranking. Many other government entities and industries in Central Florida and the State of Florida will also benefit from such an investment.

1.3 Current Accomplishments: Talent Pipeline

The University of Central Florida's College of Engineering and Computer Science (CECS) is one of the State University System's most distinctive and nationally recognized pillars of excellence.

Originally founded as Florida Technological University to support Florida's space-related economy, UCF has long excelled in engineering, computer science and related disciplines. Through its commitment to partnering with regional industry to meet the increasing workforce needs of one of the growing, dynamic job markets in the country, CECS has become the talent pipeline of choice for Central Florida's STEM-related industries.

UCF is graduating students who contribute to Florida's economy with high-paying jobs. This is evidenced, in part, by:

- In 2018-19, **68 percent of engineering bachelor's graduates were employed in Florida** and earned average first-year salaries averaging $62,574.
- *Aviation Week* magazine has named **UCF the No. 2 preferred supplier in the nation** and the **No. 1 supplier in the nation of graduates** to the U.S. aerospace and defense industries for **six consecutive years**.
- A longstanding partnership with Lockheed Martin (LM) that spans more than 40 years. In 2018-2019 the number of **UCF STEM interns at LM exceeded 500.** According to a 2018-2019 LM report, UCF has been a top school for hires over the last 10 years, hires that include more than 3,500 UCF alumni. Among the higher echelons of LM employees that are UCF alumni, there is 1 EVP, 5 VPs and 29 Directors.
- NASA's Kennedy Space Center reports that **30 percent of its employees** hold UCF degrees, mostly from CECS.

1.3 Current Accomplishments: Strong national engineering reputation

In the most recent *U.S. News and World Report* rankings, UCF achieved Top 50 public university rankings for its undergraduate and graduate engineering programs.

U.S. News and World Report	Public Ranking	Overall Ranking
Graduate Engineering	41	71
Undergraduate Engineering	47	79

Table 1: 2022 U.S. News and World Report Graduate Engineering and 2021 U.S. News and World Report Undergraduate Engineering Ranking

UCF CECS' growing national reputation shows no signs of slowing. In the past five years of *U.S. News* Graduate Engineering rankings among the current top 50 public institutions, UCF was the **2nd fastest mover** having improved 11 spots.

U.S. News and World Report ranked **every graduate engineering program in the Top 44** among public institutions.

U.S. News and World Report	Public Ranking
Optical Sciences and Engineering	5
Computer Engineering	28
Industrial Engineering	29
Electrical Engineering	33
Aerospace Engineering	35
Materials Engineering	39
Environmental Engineering	41
Civil Engineering	44
Mechanical Engineering	44

Table 2: 2022 U.S. News and World Report Graduate Engineering Programs Ranking

1.3 Current Accomplishments: Strong national computer science reputation

UCF's College of Engineering and Computer Science ranked 51st among public institutions for Computer Science.

U.S. News and World Report	Public Ranking	Overall Ranking	SUS Ranking
Computer Science	51	82	2

Table 3: 2022 U.S. News and World Report Computer Science Ranking

Additionally, the UCF student quality in these fields is evident by the national performance of the UCF Cyber Defense team (C3 (Collegiate Cyber Competition) Team), such as **winning Raytheon's National Collegiate Cyber Defense Competition (NCCDC) in 2014, 2015, 2016, 2021** and earning a 2nd place in the same competition in 2018, 2019 and 2020. In all, UCF appeared eight out of nine times in the national cyber competition and no other competitor won as many trophies as UCF (four 1st place trophies and three 2nd place trophies).

UCF's Programming team has been in existence for more than 30 years. UCF has been a perennial presence in the Programming World Finals by winning the Southeast (SE) Regional Programming Competition 60 percent of the time. In the World Finals of 2017 and 2018, the UCF team **placed 13th worldwide (1st in the US) and 10th (1st in North America),** respectively, outperforming teams from prominent universities such as MIT, UC Berkeley, Cornell, Princeton, UT Austin, University of Illinois Urbana Campaign (UIUC), Stanford, Carnegie Melon University (CMU), University of Southern California (USC) and University of Maryland. UCF is already selected to appear in the 2020 Programming World Finals (one of the 19 teams in North America chosen for the World Finals, where less than 0.1% of the teams competing globally earn a spot). The 2020 Programming World Finals have been delayed due to COVID. The 2021 North America Programming Competition (NAC) that will choose the 15 North America teams to advance to the 2021 Programming World Finals are slated to happen at UCF in August 8-15, 2021.

1.3 Current Accomplishments: Expanding Student Opportunity

Student diversity is well represented among those who graduate with UCF CECS degrees. Of approximately 2,250 degrees awarded in 2019-20, 44 percent went to minority graduates and 19 percent to female graduates.

Among bachelor's graduates, 43 percent were Pell-eligible, and 23 percent were the first in their families to attend college.

NATIONAL PUBLIC UNIVERSITY RANKINGS			
UCF	**Total Degrees**	**Degrees to African American Students**	**Degrees to Hispanic Students**
Engineering	9	5	4
Computer Science or Information Technology	5	7	2

Table 4: Engineering and Computer Science or IT National Public University Rankings

UCF has demonstrated outstanding success with previous additional state investments to improve engineering and computer science outcomes. In 2014, UCF was awarded a Targeted Educational Attainment (TEAm) Grant by the Board of Governors. UCF served as the lead institution in partnership with the University of South Florida and Florida International University to help close the gap between supply and demand in computer engineering, computer science, and information technology graduates (CSIT TEAm). The initiative promised the expansion of upper-level students and an increase in the graduation volume. After five years, **UCF achieved a 119 percent increase in these computer science-related graduates** – 288 graduates to 631 – to help address critical workforce needs.

1.3 Current Accomplishments: Quality of Student Pipeline (Honors College)

UCF's Burnett Honors College (BHC) recruits approximately 500 outstanding students annually. BHC currently enrolls about 2,200 students and is recognized as one of the top 20 honors colleges in the country. According to the Fall 2020 numbers, CECS had 137 out of the 316 UCF's National Merit scholars (43.4% of the UCF National Merit Scholars), and 272 out of the 657 UCF's Provost Scholars (41.4% of the UCF Provost Scholars). In Fall 2020, 234 out of the 534 Honors students were CECS students (43.8%). The quality of the Honors students recruited in CECS is illustrated by the fact that their average ACT, SAT and HSGPA are 32.9, 1,473 and 4.459, respectively.

1.3 Current Accomplishments: Research Excellence

External Research Funding

In terms of research success, UCF reported a new record of $204.9 million in new grants during 2020 (as of July 15 – excluding CARES Act funding), and of this total, engineering and related disciplines represented $74.2 million (36 percent) of overall grant funding.

National Ranking

Based on the National Science Foundation's 2018 Higher Education R&D survey, **UCF ranked 37th nationally for public universities** and second in the SUS for engineering research expenditures. The same survey **ranked UCF 9th nationally for public universities and first in the SUS** for computer science research expenditures.

Quality of Junior Faculty

In the last eight years, more than 80 new faculty (a significant number were junior faculty) were hired in the College of Engineering and Computer Science to improve the student-to-faculty ratio as well as to enhance research excellence. This faculty hiring focus has paid dividends in the short term and is expected to continue paying dividends in the long term. Not only have the research expenditures steadily improved (See Table 6 in Part II: Return on Investment), the NSF ranking of these research expenditures in both engineering and computer science programs has also significantly improved.

In 2019-2020, UCF led the state and ranked sixth in the nation for the number of NSF CAREER Award received by its faculty. Of these NSF CAREER awards the College of Engineering and Computer Science received seven awards, more than any institution as a whole in the State of Florida. CECS also received an additional 4 CAREER awards in 2020-2021. The NSF CAREER awards are among the most prestigious in the nation. Recognizing early-career professionals with promising research, the awards are part of the NSF's Early Career Development Program and are given to recipients who have the potential to serve as academic role models and lead their respective fields. The junior faculty in the College of Engineering and Computer Science have also received other prestigious Young Investigator awards from agencies such as NASA, Air Force Office of Research, Office of Naval Research and Defense Threat Reduction Agency.

These junior faculty have worked closely with undergraduates in UCF's Honors' college and participated in the EXCEL program (an NSF program that is now supported by UCF, which has achieved impressive results in improving the STEM graduation rates of UCF students) to provide a well-rounded education to UCF students that includes involvement in research, thus raising the quality of the produced talent pipeline. It is our intention to emulate and expand CECS's aforementioned junior faculty successes with the support from this LBR through the hiring of 64 new faculty.

Entrepreneurial Work Leading to Patents

UCF ranks 31st among public universities in the nation and among the top 100 universities in the world in generating patents, and according to new rankings released in 2019 by the National Academy of Inventors and the Intellectual Property Owners Association, UCF has ranked in the top 100 in the world for the past five years.

To spur the growth in research, UCF recently established a Big Data, Artificial Intelligence Initiative (cross-campus) with an accompanied announcement of COVID-19 seed grants. Additionally, Research for Undergraduates (REU) funded by the National Science Foundation has significantly enhanced the research capabilities of our students in the areas of Computer Vision (at more than 30 years running it is the longest-running NSF REU program in the nation), Cyber, Nano-technology and other areas.

1.3 Current Accomplishments: Employability Numbers

UCF engineering and computer science students are actively sought by industry, and the college is ranked by Aviation Week as the nation's No. 1 supplier of graduates in aerospace and defense industries. Manufacturing and computing are embraced by aerospace, automotive, medical, defense, photonics, microelectronics and other high-tech industries, such as the ones that gained Central Florida's reputation as the hub of a vibrant modeling and simulation community. CECS' current curriculum, addressing the aforementioned industry needs, accompanied with training through a plethora of internships (e.g., Lockheed Martin), is specifically designed so that students learn fundamental and practical skills needed for their professional success. In a 21st century economy, CECS students' educational experiences provide the potential for sustainable long-term employment in Florida. CECS graduates go on to become global leaders of Florida industries.

The College of Engineering and Computer Science surveys its graduating students six months after graduation to determine employment status. CECS' survey results for the 2018-2019 CECS graduating class indicated that:

- A vast majority of respondents reported being employed either full-time or part-time (88.1 percent undergraduate; 90.5 percent master's; and 92.7percent doctoral).
- Of those who reported employment, the majority of the respondents were employed on a full-time basis (93 percent undergraduate; 90.5 percent master's; and 92.1 percent doctoral).
- Of those who reported employment, many of the respondents indicated they were employed in Florida (66.1 percent undergraduate; 55.2 percent master's; and 52.6 percent doctoral).
- Of the undergraduates and graduate student respondents who provided their annual salary information, the average was $66,919 and $81,180, respectively.

In 2018-2019, CECS graduated 1,533 BS, 390 MS and 108 Ph.D. students. The employability numbers, mentioned above, indicate that CECS produced, in 2018-2019, more than 1,100 engineering and computer science graduates for Florida's economy. The number of graduates in CECS continue to increase from one year to the next. For instance, the 2020-2021 preliminary graduation numbers show that CECS has graduated 1,926 BS, 442 MS and 169 Ph.D. students. Furthermore, this LBR's focus on student retention and graduation (EXCEL learning communities, math boot camps, 4-year graduation of FTICs) are expected to further increase the number of CECS graduates in future years. Therefore, it is expected that CECS, by 2023-2024, will be producing, with this LBR's support, well over 2,500 engineering and computer science graduates (undergraduate and graduate), annually, for the State of Florida.

1.4. Projected Impact

UCF's Collective Impact Strategic Plan includes promises designed to elevate the university, demonstrate a commitment to students, and impact our region, state and nation.

Promise 1: Attract and cultivate exceptional and diverse faculty, students and staff. This promise directly relates to the proposed hiring plan and student support enhancements.

Promise 2: Deploy our distinctive assets to solve society's greatest challenges. This is supported by UCF's enabling technologies and the talent pipeline that UCF is generating in these fields.

Promise 3: Create partnerships at every level that amplify our academic, economic, and cultural impact and reputation. This is demonstrated by the partnerships detailed earlier and their potential illustrated in Figure 1.

The above promises will fulfill the two overarching goals of this LBR effort: Goal A: *Enhance Research and Educational Excellence/Industry Partnerships* and Goal B: *Enhance Student Success*.

The Overall Impact of *UCF Powering Up Florida's High-Tech Economy is* to **power the UCF College of Engineering and Computer Science past the Top 40 of the *U.S. News and World Report* undergraduate and graduate public university rankings by 2025, with an aspirational goal of the Top 25 by 2035.**

The specific LBR request is broken down in the table below (Table 5). Called *UCF Powering Up Florida's High Tech Economy*, the plan will enhance distinctive areas in engineering and computer science, referred to as enabling technologies, better serve the needs of the focal application areas of aviation, space, energy, while accomplishing the following transformative outcomes (impacts) described in this section.

UCF Powering Up Florida's High Tech Economy	
a. 64 faculty members	$13.1 million recurring
b. 16 support positions	$1.3 million recurring
c. EXCEL/Bridge Program Investments	$2 million recurring
d. Funds for Student Assistants	$2 million recurring
e. Laboratory Equipment Upgrades	$3 million non-recurring
Total	**$21,422,400**

Table 5: Breakdown of UCF Powering-Up Florida's High Tech Economy Resources Request

Impact 1: Attain higher research excellence and economic prosperity.

The additional 64 faculty lines included in this request will help enhance UCF's existing research strengths and industry partnerships in key application areas for the state, such as aviation, space and energy and the cross-cutting application area of digital twin. These research strengths and industry partnerships will positively influence a plethora of industries and government agencies, as Figure 1 illustrates. These new faculty lines will help the College of Engineering and Computer Science reach its goal of $115 million in research funding by 2023-2024, as well as enhance the quantity, quality and diversity of the talent pipeline needed by Florida's economy. The requested $3 million in laboratory equipment upgrades and additional 16 research support lines will provide the necessary infrastructure to propel UCF's research in the enabling technologies and relate application areas to greater levels.

As Orlando's only public research university, UCF is the academic research leader for Central Florida. The university has achieved more than $1 billion in external research grants during the past decade and continues to be one of 94 public institutions in the nation designated as

an "R1: Doctoral University: Very high research activity" among Carnegie classifications. In the last two years, UCF set a university record with more than $200M each year in research awards.

UCF faculty drive Central Florida's research enterprise, both in their laboratories and through partnerships with industry and government agencies, advancing economic development through translational research. UCF faculty play a critical role in the pursuit of excellence. Below, we describe 1) the application areas of aviation, space, energy that this LBR focuses and 2) the expertise in enabling technologies that would propel UCF to higher level of research excellence, enhance the fortunes of industry whose core business is in these application areas and as such strengthen the state's economic prosperity. Figure 3 illustrates the application areas and enabling technologies in an illustrative graphic whose intersection emphasizes this LBR's expected impact. Central Florida provides a unique locational advantage for such an intersection of enabling technologies and application areas of focus and as such has the potential, through UCF-industry partnerships, as illustrated in Figure 3, to power up Florida's high-tech economy.

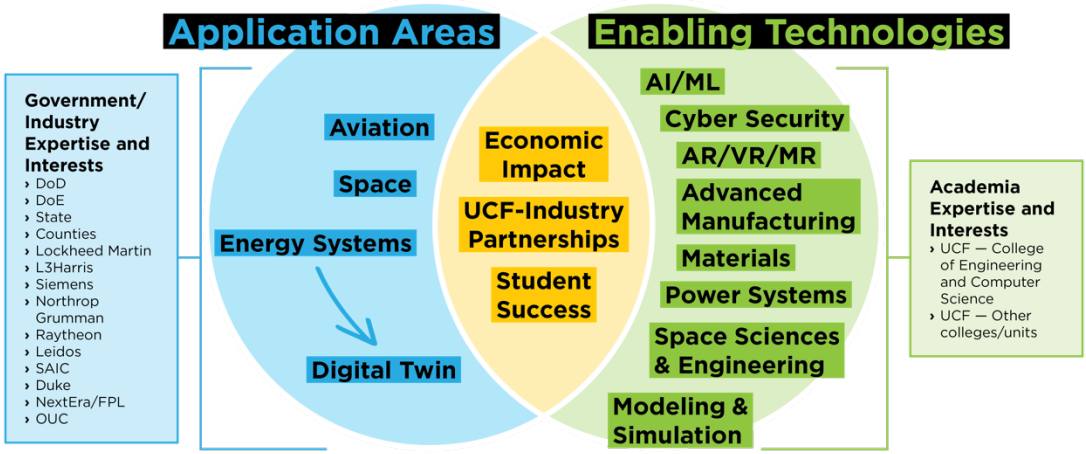

Figure 3: The graphic above illustrates the application areas of focus (aviation, space, energy), the industries that have core business units in these areas, UCF's strengths in enabling technologies (AI/ML, AR/VR/XR, cyber, aerospace science and engineering, power systems, modeling and simulation) that support these application areas and the importance of this collaborative existence that has the potential to power up Florida's high tech industry and achieve the illustrated impacts.

Impact 2: Enhance successful student outcomes/Improve talent pipeline to address industry needs.

Hiring 64 faculty strategically in enabling technology areas to address the industry needs in space, aviation, energy and other application areas, would increase student retention and graduation rates and shorten average time to degree. The improved educational and research portfolio of the new faculty will lead to student cross-cutting and creative training in areas that would power the future economy with more efficiency toward degree completion and reduced costs for students. Hiring more faculty members will ensure UCF meets *and exceeds* its institutional strategic plan goal of offering additional class sections, particularly for high-demand STEM pathway courses. Increasing the number of faculty enhances the student

experience by providing more opportunities for quality student-faculty engagement in both education and research.

The College of Engineering and Computer Science 4-year graduation rate is one of the focal pursuits of this LBR effort. While only 30 percent of CECS students graduate in four years, this is a significant improvement over the 23 percent 4-year graduation rate observed in 2016. Furthermore, our data show that another 14 percent graduate in just one extra semester, which indicates that there is a potential of significant improvement with a focused, targeted effort. If those students are able to graduate *one semester earlier*, the overall four-year graduation rate for UCF would immediately rise by 3 percentage points based on CECS improvements alone.

By hiring more faculty and graduate assistants, we would increase the capacity of programs that recruit, sustain and graduate a diverse population of STEM students at high rates by focusing on STEM learning communities and early engagement in undergraduate research experiences (e.g., EXCEL program at UCF). The increased faculty and graduate assistant resources would expand and enhance bridge programs, such as math bootcamps that improve the math placement status of incoming FTICs and thus enhance their 4-year graduation chances. These programs ensure our students are successful within their degree programs and are best prepared for high-paying jobs upon graduation.

UCF will Power Up student success in engineering and computer science by:

- **Tripling the EXCEL program**, including the expansion of the supported math courses from College Algebra through the Calculus sequence and into Differential Equations.
- **Tripling the EXCEL learning communities** that place cohorts of students into math, introduction to engineering, and science courses.
- Offering **10 times as many seats** in Math Bootcamps.

Originally started in 2006 with an NSF grant, UCF's EXCEL program focuses on the first two years of student enrollment and increases the likelihood of graduation in a chosen STEM discipline. EXCEL accomplishes this feat by creating STEM-learning communities that focus on math skills in year one, providing early engagement with undergraduate research experiences in year two, and expanding the personal advising that the students get in their first two critical years of their college experience. EXCEL has impacted more than 3,000 students, has improved STEM graduation rate by more than 50%, attained higher than 50% improvement in graduation rates for underrepresented groups, and is serving a highly diverse (high percentages of women and underrepresented minorities in its cohorts) student population. Through the proposed scaling up (a factor of 3) EXCEL successes will be expanded to a much larger number of a highly diverse student pool. EXCEL has recently implemented a summer math bootcamp for a small number of its students, where students are exposed, through a one-week 40 hour bootcamp, to math topics that they would need in their to-be-taken fall math courses. This refresher math bootcamp allows students to place (through a math placement test after the completion of the math bootcamp) at a higher level math course in the Fall semester, than they would have placed without the refresher course. The outcomes of this pilot program are impressive. Every student who participated in the EXCEL summer math bootcamp placed at one or two levels higher math fall class, where they performed well. This summer bootcamp approach gives the opportunity to students to graduate faster, preferably in 4 years. EXCEL's proposition to increase the seats in this

bootcamp by 10-fold will impact positively a lot more students and impact significantly the 4-year graduation rate of STEM students at UCF.

1.4 Focal Application Areas and Enabling Technologies

In Section 1.1, *Overall purpose of the Plan*, we briefly discussed the application areas that this LBR focuses on (aviation, space, energy, cross-cutting digital twin) and the enabling technologies that are multi- and transdisciplinary and support the application areas. It is worth mentioning that the enabling technologies that are current UCF's strengths, and are to be strengthened further through this LBR request, impact the core business of many DoD agencies (in UCF's Research Park with strong concentration on modeling, simulation and training), as well as many other industries that impact Central Florida's and the State's economy (e.g., entertainment industry). In this section we elaborate further on these core business areas and the associated enabling technologies.

Application Areas' Value for Florida: Space, Aviation, Energy, Cross-cutting Digital Twin

According to the National Association of Manufacturing (NAM)[6], manufacturers in Florida account for over 5 percent of the total output in the state, employing 4 percent of the workforce. The total output from manufacturing was $56B in 2018 from an average of 327,000 manufacturing employees in Florida, with an annual overall compensation of more than $66,000 per employee. The aviation, space and energy/power industries in Central Florida are thriving and well-diversified. UCF has robust partnership with many of these industries (e.g., Lockheed Martin, L3Harris, Northrop Grumman, Siemens, FPL, Duke), especially in the Central Florida region. Furthermore, UCF's strong relationship with the many DoD entities in UCF's Research Park that fuel the thriving modeling and simulation community in Central Florida, and across the nation, is a unique asset that UCF has relied upon for its past successes and will rely upon for its future, enhanced promised accomplishments.

There are 600+ aerospace businesses, 20 major military installations and $6.8B in annual Florida aviation and aerospace exports. Florida has a rich supply chain and highly skilled workforce to support aviation and space. Boeing, Embraer, Lockheed Martin, SpaceX, Blue Origin and ULA are just a few of the companies pushing the envelope in aviation and aerospace in Florida [Enterprise Florida]. In the energy and power generation sector, Siemens Energy, Pratt & Whitney, Mitsubishi Power Systems, Alstom/Power Systems Manufacturing, Aerojet Rocketdyne, Florida Turbine Technologies are some of the businesses located in Central Florida. Together with the two US utility companies, NextEra (FPL) and Duke, these businesses employ thousands of UCF graduates every year.

Enabling Technologies' Value for Florida: AI/ML, Cyber Security, AR/VR/MR, Space Engineering, Energy, Manufacturing, Automation, Modeling & Simulation

Enabling technologies that have brought economic prosperity in the State of Florida - and is projected to continue – include the following (all computing-related areas of focus and of critical importance in the digital era): Artificial Intelligence, Machine Learning, Cyber Security, Augmented Reality/Virtual Reality/Mixed Reality, and Modeling and Simulation (AI-ML/Cyber/AR-VR-MR/MS).

The need for workforce talent in the computing areas is significant and part of the focus on this LBR will be to recruit faculty and train students in these areas. According to the Bureau of Labor Statistics[2], "Employment of computer and information technology occupations is projected to grow 12 percent from 2018 to 2028, much faster than the average for all occupations. These occupations are projected to add about 546,200 new jobs. Demand for these workers will stem from greater emphasis on cloud computing, the collection and storage of big data, and information security." In particular, for AI, a 2019 report from Gartner[3] shows that enterprise applications for AI have grown 270 percent in four years, fueling a level of demand that outstrips the current supply of qualified job candidates.

AI-ML, Cyber, AR-VR-MR are areas of increasing and sustained critical importance to the modeling and simulation community in Central Florida, which has been designated as the State's Center of Excellence in Modeling and Simulation. UCF's main campus is adjacent to Research Park, a unique collaborative alliance formed by U.S. leading military modeling and simulation R&D commands (PEO STRI (Army), NAWCTSD (Navy), AFAMS (Air Force), PM TRASYS (Marines)). UCF's Research Park is home to several branches of the military and a vibrant modeling and simulation industry boasting 100+ companies. The US Department of Defense in UCF's Research Park provides $6 Billion annually in contracts to companies in UCF's vicinity as well as other companies nationwide. This year, the Navy established the NavalX Central Florida Tech Bridge and the Tech Grove, a public-facing entity formed through a partnership between NAWCTSD and UCF's Research Foundation to solve challenging warfighter problems. The state is significantly vested to sustain and enhance the status of Central Florida as the nationwide location of excellence in modeling and simulation and has invested in five Partnership buildings that co-house the military, the well-renowned UCF's Institute for Simulation and Training and the National Center for Simulation (representing 260+ companies). AI-ML, Cyber, AR-VR-MR are of increasing and sustained interest to a number of Aerospace and Defense companies, such as Lockheed Martin, L3Harris, Northrop Grumman, Raytheon, Leidos and SAIC, as well as entertainment giants such as Disney, Universal and Sea World, all of which are in short driving distance from UCF.

Enabling Technologies' Strengths at UCF: AI/ML, Cyber Security, AR/VR/MR, Space Engineering, Energy, Manufacturing, Automation, Modeling & Simulation

AI-ML, Cyber, AR-VR-MR, Modeling and Simulation are areas of existing strength at UCF. An example of strength of AI-ML related research at UCF is the Center for Research in Computer Vision (CRCV), established in 2012, which has been funded extensively by federal sources (e.g., DARPA, NSF) and industries (e.g. Lockheed Martin, L3Harris). Computer Vision's increased prominence in solving important problems in a number of application areas (surveillance, automation) relies on recent advances in AI (e.g. Deep Learning) and high-performance computing (e.g. GPU's). According to CSRankings.org Computer Vision Research at UCF is ranked in the top 20 in the nation ahead of many premier institutional powerhouses and every other institution in the State of Florida.

Another example of strength in AI-ML related research at UCF is Transportation Science and Technology led by faculty in Civil, Environmental and Construction Engineering (CECE). Transportation Science and Technology at UCF has been extensively funded by federal sources (USDOT) and state sources (FDOT). According to the 2020 ARWU (Academic Ranking of World Universities), UCF's Transportation Science and Technology has been ranked No. 5 in the U.S. ahead of some of the most prominent institutions around the nation.

UCF's increased prominence in Transportation Science and Technology is fueled by the increased focus on AI-ML, Big Data and the increased computing power that makes extraction of knowledge from big data possible.

A recently established Cyber cluster is providing strength in the Cyber area. This past year, the Cyber Cluster brought in a multi-million-dollar research portfolio funded by a number of federal agencies (e.g., NSF, DoD) and industry (e.g., Sophos). This strong research presence accompanied by the sustained and impressive accolades of UCF's Cyber team provides a multi-faceted UCF strength hard to emulate elsewhere. This year, UCF faculty and students partnered with industry and DoD to pioneer a cyber red team pipeline program to grow the next generation of cyber operators that conduct national defense cybersecurity assessments. This cyber workforce development program is vital for Central Florida as home to the National Cyber Range Complex and U.S. Cyber Command's Persistent Cyber Training Environment.

Faculty in the AR-VR-MR/Modeling & Simulation area are also housed in the College of Nursing, College of Medicine and College of Arts and Humanities, with a focus on the science and applications of these topical areas. The AR-VR-MR/Modeling & Simulation interest is further enhanced by the parallel interest of the entertainment industry (Disney, Universal), partially served by the Themed Experiences program, led by the College of Arts and Humanities with support from the College of Engineering and Computer Science and the Rosen College of Hospitality Management. This interest is also enhanced by the parallel interest of the medical community, spearheaded by the College of Medicine and the College of Nursing, to incorporate simulation-based education in medicine (education and research). More importantly, there is parallel increased interest of the education community (nationwide) to incorporate AR-VR-MR/Modeling & Simulation to more effectively engage in remote teaching and learning.

Strengths in Application Areas at UCF: Aviation, Space and Energy.

The topic areas represented in the application areas of aviation, space, energy are part of the core business areas for a number of large industries and government agencies in the state as emphasized in Section 1.1 and illustrated in Figure 3.

By providing targeted education and training for employees of the Florida companies previously mentioned, by collaborating on government-related research and by preparing our students as next generation employees in future technologies, UCF has taken a strong role in partnership with these companies. UCF has already established three energy-focused clusters.

One such example is CATER (Center for Advanced Turbomachinery and Energy Research), with strong, consistent support from industries such as Siemens, and through federal funds from agencies such as AFRL and DoE. CATER has several dedicated faculty conducting research in interdisciplinary areas of aerodynamics, alternative fuels, material coatings and integrity, and design and manufacturing. Areas of focus for this Center are improved composites, compact turbomachinery and energy storage for smaller power plants and digital twin. Digital twin refers to a cyber-physical system (CPS) that tracks aging and degradation of the physical twin and is accordingly continuously updated. CATER's digital twin focus will benefit from advances in AI, Big Data, cyber security and modeling and simulation of utilities and power generation systems. Power generation is undergoing disruptive changes with

interconnected dependence on water, and tomorrow's power generation systems will be extremely complex, thus requiring digital twin for plant control and maintenance. Similar prospects are available for aviation and space systems as well, where safety is of paramount importance.

Another example of an energy center is RISES (Resilient, Intelligent, Sustainable, Energy Systems). RISES has been funded extensively by DoE, NSF, and industries such as Siemens, Duke and FPL. The center aims to develop resilient and secure cyber-physical systems for critical energy and infrastructure systems through modeling and simulation, distributed optimization and control, and data-driven decision-making (AI-ML). The center leverages its domain knowledge in sustainable energy, intelligent transportation, and smart community. The center will collaborate with Siemens on developing educational activities and established laboratories (Smart Grid Lab and Smart Infrastructure Data Analytics Lab). Two more labs have been recently branded by Duke, FPL and GE. An example of a digital twin application under the auspices of this Center would involve creating a digital twin of a building, followed by modeling and simulation of the building's various components and then a validation and testing of the digital twin model by using data.

UCF's strengths are multi-faceted in the space area. In a recent report[7] submitted by faculty in Mechanical and Aerospace Engineering, a number of UCF's existing expertise and research efforts that support many of NASA's 2020 Technology Taxonomy have been identified.

- In *Robotic and Autonomous Systems* some of the efforts include: development of intelligent user interfaces to assist humans on complex robot teleoperation tasks; designs of real-time optimal trajectories in a confined, crowded environment.
- In *Aerospace Propulsion, Power and Energy* some of the efforts include: combustion experiments that benefit from enhanced engine design schemes enabled by accurate multistage chemical kinetic models; novel low-cost solid-solid energy conversion technology experiments that would enhance NASA's abilities to operate thermal generation centers on hot environments such as Venus.
- In *Sensor, Sensor Deployment* some of the efforts include: structural diagnostics through laser based sensing; sensor deployment using deployable structures, balloon structures, thin-ply composite materials and development of active sensor materials; study of high-speed sensors and diagnostics for measuring critical key parameters for lunar exploration vehicles and propulsion systems.
- In *Shape Memory Alloys and Metamaterials*, efforts include: design, fabrication, and characterization mechanisms for robotic/autonomous assembly and deployment; characterization of ceramic coating systems and their lifetimes; studies on lunar dust, its mitigation and plume-surface interactions.
- On the topic of *3D Printing/Additive Manufacturing*, some of the efforts include: characterization of material and mechanical properties of additively manufactured parts to understand the effects of processing parameters and post-processing treatment.

In addition to the above efforts, the College of Optics and Photonics (CREOL) has been funded by several arms of DoD. For instance, CREOL currently has 11 projects with DARPA that include the development of the world's fastest laser, optical fibers, integrated photonics, nonlinear and quantum optics, sensing and display. These technologies have applications in

industry and manufacturing, communication and information technology, biology and medicine, energy and lighting, and defense and homeland security.

To continue to excel in our research and provide the talent pipeline to our industry partners, UCF will hire faculty that have expertise in the various focal application areas and in support of the enabling technologies that spearhead innovation and further development in these application areas.

LBR Request, Revisited

The additional 64 faculty lines included in this request will help enhance UCF's existing research strengths and industry partnerships in these key areas for the state. These new faculty lines will help the College of Engineering and Computer Science reach its goal of $115 million in research funding by 2023-2024, as well as enhance the quantity and quality of the talent pipeline needed by Florida's economy. The requested $3 million in laboratory equipment upgrades and additional 16 research support lines will provide the necessary infrastructure to propel UCF's research to greater levels. The additional funds requested for the EXCEL program and bridge programs and the student assistants' support will enhance the academic credentials of the student pipeline, entering UCF, so that they are successful in their pursuit of STEM degrees that Florida's economy needs.

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.*

UCF's Powering Up Florida's High-Tech Economy aligns with regional economic needs, the university's strategic plan and the Board of Governors strategic plan.

In its September 2019 report, the Orlando Economic Partnership[8] highlights the importance of "the alignments of UCF's focus on engineering and computing with the Partnership's Three-Year Mission." The report confirms UCF's plan aligns with regional efforts, including "the expansion of initiatives designed to enhance our talent ecosystem. These broad sector categories will be driven by the diffusion of key enabling technologies – ranging from 5G and distributed ledger technologies to co-biotics and extended reality – each clearly supported by UCF's enhanced E/C (Engineering and Computer Science) focus."

Powering Up Florida's High-Tech Economy serves to strengthen both regional economic development alignment as well as the alignment between UCF's areas of strength and the Board of Governors 2025 Strategic Plan goals for the State University System. Excellence is included through increased reputation of the academic programs and improved student success. Productivity is supported by research expenditures and student pipeline and diversity. The third core area, Strategic Priorities for a Knowledge Economy, is demonstrated by the selection of engineering and computer science as the area of expansion and enhancement.

The return on investment for the requested funds will be measured by progress toward the objectives and key performance targets set forth in the university's Collective Impact Strategic Plan[9] (https://www.ucf.edu/strategic-plan/).

Through UCF's annual Accountability Plan and the institutional strategic plan implemented in 2016, the university already has a robust tracking system on progress toward its goals, using institutional data alongside statewide and national benchmarks.

This investment will result in further improvements to UCF's Accountability Plan priority metrics of increasing student success, strengthening our faculty and staff and increasing our research impact by 2025.

Attain higher research excellence and economic prosperity (Impact 1)

Faculty hires related to research of strategic statewide importance will benefit key measures of success, including research expenditures and the number of post-doctoral appointees. Benchmarks for these metrics are included in the university's Accountability Plan and additional investments will result in improved outcomes.

Metric	History	Current	Trend	Trend with Investment
CECS Research Expenditures (in millions)	$47.4 2013-14	$92.1 2018-19	$105.0 2023-24	*$115.0* *2023-24*
NSF Engineering Research Expenditure Rank (among publics)	66 2013-14	37 2018-19	33 2023-24	*Top 30* *2023-24*
NSF Computer Science Research Expenditure Rank (among publics)	25* 2013-14	9 2018-19	7 2023-24	*Top 6* *2023-24*

* Note: Ranking was Math and Computer Science combined in 2013-14

Table 6: UCF Powering-Up Florida's High-Tech Economy Metrics (Set 1)

Enhance Successful Student Outcomes (Impact 2)

UCF has developed college-based Accountability Plan metrics and targets. Hiring additional academic advisors and faculty will allow CECS to exceed the positive trajectory already planned for student success metrics including 4-year graduation rate, academic progress rate and excess hours rate. In turn, this will also have a positive impact on the average cost to the student, ensuring UCF's continued affordability and high-quality education.

Metric	History	Current	Trend	Trend with Investment
CECS First-year Retention	85.5% 2013-14	93.2% 2019-20	91.7% 2023-24	*93.5%* *2023-24*
CECS Four-year Graduation Rate	21.0% 2010-14	30.0% 2016-20	35.0% 2020-24	*37.0%* *2020-24*
CECS Six-year Graduation Rate	63.8% 2008-14	68.4% 2014-20	69.5% 2018-24	*70.5%* *2018-24*
CECS Average Time to Degree	4.71 2014-15	4.58 2019-20	4.40 2023-24	*4.32* *2023-24*
CECS Percent of Students Graduating Without Excess Hours	54.2% 2014-15	67.6% 2019-20	69.0% 2023-24	*71.5%* *2023-24*

Table 7: UCF Powering-Up Florida's High-Tech Economy Metrics (Set 2)

Improve the talent pipeline (Impact 2)

The focus on bridge programs and diverse alumni will benefit the metrics associated with diverse graduates and alumni success, including median wages of bachelor's graduates employed full-time.

Metric	History	Current	Trend	Trend with Investment
CECS Bachelor's Degrees Awarded	1,301 2014-15	1,688 2019-20	1,800 2023-24	*1,900* *2023-24*
CECS Bachelor's Degree Diversity	34.3% 2014-15	48.5% 2019-20	50.5% 2023-24	*51.5%* *2023-24*
CECS Bachelor's First-Year Salaries	$58,645 2014-15	$62,574 2018-19	$63,000 2023-24	*$64,000* *2023-24*

Table 8: UCF Powering-Up Florida's High-Tech Economy Metrics (Set 3)

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.*

The ***UCF Powering Up Florida's High Tech Economy*** initiative will enhance the enabling technologies [AI-ML, Cyber, AR-VR-MR, Modeling and Simulation, others] to serve industrial needs in aviation, space and energy by hiring 64 FTE faculty in the ranks of Assistant, Associate and Full Professors, with a larger number of hires targeting assistant professor rank. The academic areas of expertise of these faculty hires will be in line with the enabling technologies mentioned above. In addition, we plan to hire 16 FTE support staff to assist these faculty in their educational and research efforts. These anticipated hires will help the College elevate its ranking to amongst top 40 publics and is in line with UCF's 2021 Accountability Plan. The projected impacts to: 1) attain higher research excellence and economic prosperity and 2) enhance success in student outcomes and improve talent pipeline to address industry needs, as articulated in Section 1.4, will help the College of Engineering and Computer Science attain higher levels of national recognition and ranking for excellence.

IV. Facilities *(If this issue requires an expansion or construction of a facility, please complete the following table.):*

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

No expansion or construction of a facility is requested through this LBR.

REFERENCES

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4. Global Attractions Attendance Report, Themed Entertainment Association/AECOM), 2019. www.tripinfo.com/itm/articles/the-2019-global-attractions-attendance-report
5. www.twi-global.com/technical-knowledge/faqs/what-is-digital-twin
6. https://www.nam.org/state-manufacturing-data/2019-florida-manufacturing-facts/
7. Mapping a Trajectory for STEM Readiness in Space Technology, NASA Report, UCF, 2021.
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9. UCF Strategic Plan | Creating Our Collective Impact

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

University: **University of Central Florida**

Issue Title: **UCF University of Distinction in Engineering and Computer Science**

	RECURRING	NON-RECURRING	TOTAL
Positions			
Faculty	64.00	0.00	64.00
Other (A&P/USPS)	16.00	0.00	16.00
Total	80.00	0.00	80.00
Salary Rate (for all positions noted above)			
Faculty	$10,240,000	$0	$10,240,000
Other (A&P/USPS)	$960,000	$0	$960,000
Total	$11,200,000	$0	$11,200,000
Salaries and Benefits	$14,811,200	$0	$14,811,200
Student Assistants	$2,000,000	$0	$2,000,000
EXCEL/BRIDGE/Labs	$2,000,000	$3,000,000	$5,000,000
Operating Capital Outlay	$0	$0	$0
Electronic Data Processing	$0	$0	$0
Special Category (Specific)	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
Total All Categories	$18,811,200	$3,000,000	$21,811,200

Attachment B

State University System
Education and General
2022-2023 Legislative Budget Request
Form I

University(s):	**University of Central Florida**
Request Title:	**Advancing Medical Education and Healthcare in Central Florida**
Date Request Approved by University Board of Trustees:	
Recurring Funds Requested:	**$5,000,000**
Non-Recurring Funds Requested:	**$0**
Total Funds Requested:	**$5,000,000**
Please check the request type below:	
Shared Services/System-Wide Request	☐
Unique Request	☒

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.*

UCF requests a recurring state appropriation of $5,000,000 for the UCF College of Medicine. Expansion of base funding is critical to ensuring the success of UCF's College of Medicine while also ensuring its ability to serve the people of Central Florida. With additional recurring funds, UCF will enhance the delivery of a dynamic medical school curriculum that includes students, residents, and fellows who will meet the needs of Florida's increasingly diverse and aging population. The increase in funding will provide opportunities to increase the number of trained physicians who stay in Florida, improve public heath, address healthcare disparities, and expand interdisciplinary research that links healthcare with UCF's strengths in engineering, optics, and modeling and simulation. These outcomes will increase partnerships that expand the economic impact of Medical City, a destination focused on global excellence in medical education, research, and patient care.

UCF's College of Medicine was created by the Legislature in 2006 to serve as the academic foundation of an emerging Medical City at Lake Nona and to bolster economic development in the state just minutes from one of the world's most visited airports. UCF's medical school sparked the development of an entire city, now hailed as an emerging aerotropolis. Lake Nona is now home to a nationally recognized children's hospital, one of the largest VA hospitals in America, the VA's National Simulation Center, and innovative, international corporations including Amazon, KPMG, Johnson & Johnson and GuideWell. In its brief history, UCF's College of Medicine has created a nationally recognized M.D. curriculum with students scoring at the top quadrant nationally in all levels of performance and recently opened a new academic hospital and cancer research and treatment center in Lake Nona adjacent to its campus.

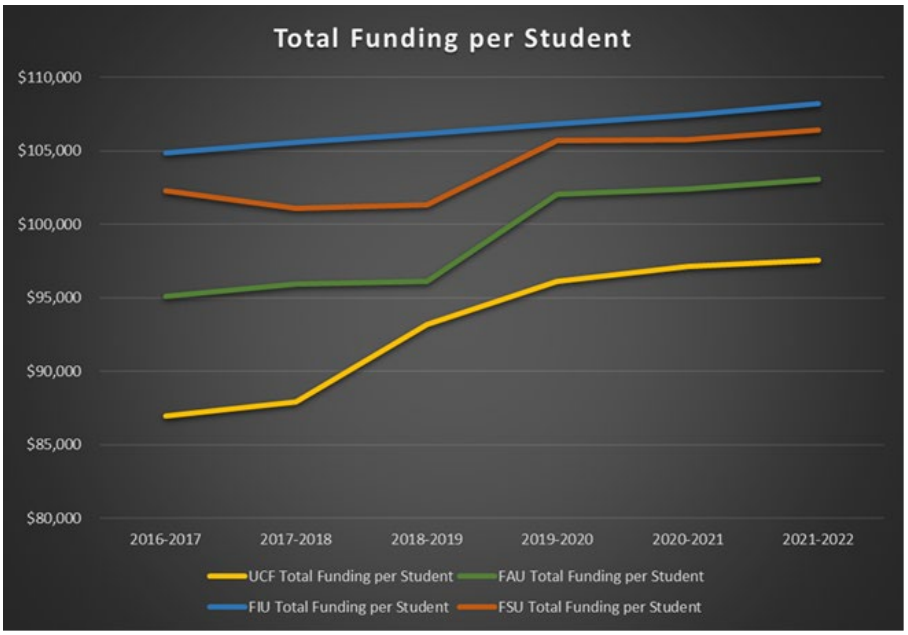
With Lake Nona emerging as a national destination for healthcare innovation, UCF will use new recurring funds to continue serving as the academic cornerstone of Florida's Medical City. New funds will allow UCF's College of Medicine to:

- Hire full-time clinical faculty who will lead educational experiences, population health research, and community programs to improve population health and provide care to Central Florida communities.
- Expand interdisciplinary teams of scientists, clinicians, and population health experts who will lead communities to both health and economic success while also providing interdisciplinary experiences that prepare our graduates for solving tomorrow's greatest challenges.
- Hire needed faculty and staff to build more residencies and fellowships to address Florida's physician shortage and to provide training sites for Florida medical students. Currently, the College of Medicine has one of the fastest growing graduate medical education programs in the state, with 520 residents in training this July.
- Hire a faculty oncologist to lead cancer research for the UCF College of Medicine's emerging cancer research and treatment center that will bring a new model of cancer care to Orlando.

The UCF College of Medicine is also the heart of UCF's new Academic Health Sciences Center, which has united the university's health- related disciplines to increase interprofessional research, education and patient care. An investment in needed medical school faculty will advance research programs that bring added resources to the university and Central Florida community. Today's medical care and healthcare systems are increasingly team-based. With new funding, UCF will be able create a new model of interprofessional medical education, research and patient care in a Medical City devoted to biomedical science, innovation, and wellness. The new recurring funding in this request will be used by the College of Medicine to pursue more joint faculty appointments with UCF's College of Nursing and College of Engineering to leverage the university's existing strengths.

While UCF's College of Medicine has continued to produce outstanding student outcomes, it has received feedback from its accrediting body regarding resources. Each medical school must meet the accreditation requirements of the Liaison Committee on Medical Education (LCME). These accreditation requirements include expectations of sufficiency of financial resources and clinical training resources; sufficiency of faculty and staff; up-to-date facilities for medical education; support services for medical students; and appropriate technology and educational infrastructure. Meeting all of these accreditation standards requires the appropriate funding levels. The LCME has expressed concern regarding resources available to the UCF College of Medicine on each of its accreditation visits to date.

This new funding will allow the UCF College of Medicine to continue to excel, maintain its accreditation, while also creating more equitable funding across the state's newest public medical schools. When compared to Florida's newest public medical schools, UCF's College of Medicine has the lowest base funding per student. Base funding includes education and general funds and tuition.



For 2021-22, UCF's College of Medicine base funding totaled $46.8 million which equals approximately $97,550 per student.

Florida's Newest Medical Schools	**2021-22 Total Funding per Student**
Florida International University	$108,200
Florida State University	$106,420
Florida Atlantic University	$103,100
Average	**$105,900**

Compared to Florida's other three newest medical schools, UCF's total funding per student is 8.2% below the average of $105,900. This request would bring UCF more in-line with its peers within the State University System.

This Legislative Budget Request closely aligns with the 2021 UCF Accountability Plan. As stated in the plan, "UCF aspires to be one of the nation's leading metropolitan research universities, with a focus on student success and contributing to the betterment of society. A research university that's tightly coupled with urban growth, with entrepreneurship and with partnerships to develop the talent that simultaneously attracts and drives the innovation and investment to move our region and state forward." The UCF Academic Health Sciences Center and Lake Nona Medical City, anchored by the College of Medicine, play a key role in achieving UCF's goals and aspirations including research, impact in health-related fields, and the local economy.

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.*

This LBR request would bring UCF's College of Medicine funding in line with funding per student at Florida's other new state medical schools and enable UCF to:

Investment	Outcome
Maintain College of Medicine LCME accreditation with adequate financial and human resources.	Continued accreditation

Hire needed nationally recognized physician scientists who are experts in areas that command significant research dollars with interdisciplinary skillsets that connect with UCF's existing strengths.	8 new faculty hires $5 million+ in research
Continue partnerships with industry in Medical City by hiring faculty and staff who can lead healthcare and economic development partnerships that increase research and new business development while educating UCF students.	Estimated over $500 million in economic development 8 new faculty hires
Retain top scholars and researchers that enhance the profile and reputation of medical education and research in Central Florida.	Retain 10 faculty members
Increase scholarships and student support programs that allow the medical school to recruit, retain. and graduate students of all backgrounds.	Meet accreditation requirements.

With a current budget of $46.8 million, the UCF College of Medicine's accomplishments have helped bring a national reputation to the Medical City at Lake Nona and its programs for improving healthcare for all. The proposed increase in base funding will provide the medical school the ability to magnify its impact on students, scientific research and patient care while also providing the financial support needed for LCME accreditation.

See UCF COM LBR Position and Fiscal Summary Operating Budget Form II

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.*

1. Hire new faculty in interdisciplinary areas to support the M.D. program curriculum and grow interdisciplinary research. The minimum new faculty and staff effort needed would include:

Faculty needs	% effort FTE
OB/GYN Teaching Faculty	1.5

Pathology	1.5
Pharmacology	1.0
Physiology	1.0
Population Health	1.0
Oncology	1.0
Health Systems Sciences	0.5
Infectious Diseases	0.5
Gastroenterology	0.5
Clinical Pharmacology/PharmD	1.0
Endocrinologist	0.5
Practice of Medicine	1.0
Generalist	1.0
Community Outreach Director	1.0
Director of Diversity, Equity, Inclusion	0.5

2. Retain top scholars and researchers, including:

Current Appointment	Department
Assistant Professor	Internal Medicine
Assistant Medical Librarian	Medical Education
Assistant Professor	Internal Medicine
Associate Professor	Clinical Sciences
Associate Professor	Burnett School
Associate Professor	Burnett School
Assistant Professor	Burnett School
Assistant Professor	Burnett School
Instructor	Burnett School
Associate Professor	Faculty Affairs
Assistant Professor	Clinical Sciences

****See UCF COM LBR Position and Fiscal Summary Operating Budget Form II***

IV. Facilities (*If this issue requires an expansion or construction of a facility, please complete the following table.):*

	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
(to be completed for each issue)

University: **University of Central Florida**

Issue Title: **Advancing Medical Education and Healthcare in Central Florida**

	RECURRING	NON-RECURRING	TOTAL
Positions			
Faculty	$3,721,000	0.00	3,721,000
Other (A&P/USPS)	$902,200	0.00	902,200
Total	$4,623,200	0.00	4,623,200
Salaries and Benefits	$4,623,200	$0	$4,623,200
Other Personal Services	$0	$0	$0
Expenses	$126,800	$0	$126,800
Operating Capital Outlay	$0	$0	$0
Electronic Data Processing	$0	$0	$0
Financial Aid	$250,000	$0	$250,000
Special Category (Specific)	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
Total All Categories	$5,000,000	$0	$5,000,000

Attachment C

State University System
Education and General
2022-2023 Legislative Budget Request
Form I

University(s):	**University of Central Florida**
Request Title:	**PTSD Clinic for Florida Veterans & First Responders (RESTORES)**
Date Request Approved by University Board of Trustees:	
Recurring Funds Requested:	**$515,000**
Non-Recurring Funds Requested:	
Total Funds Requested:	**$515,000**
Please check the request type below:	
Shared Services/System-Wide Request	☐
Unique Request	☒

I. Purpose

UCF RESTORES provides treatment and resiliency services at no cost to Florida's veterans, active duty personnel, first responders, and survivors of sexual assault, mass shootings or natural disasters.

Treatment Services: Our innovative three-week intensive outpatient treatment program, where personnel are treated three per day, five days per week, is the only program of its kind in the country. The program includes the use of virtual reality (sights, sounds, and smells) to enhance the effects of the therapy and we have seen remarkable success.

To date, we have treated 700 veterans/active duty personnel, 600 first responders (law enforcement, firefighters, emergency medical technicians/paramedics, and emergency dispatchers), sexual assault survivors, as well as Florida residents who are survivors of the Pulse nightclub, Las Vegas and Parkland mass shootings. Using the same "success" criteria as the VA, 67% of veterans and 77% of first responders no longer meet diagnostic criteria for PTSD after three weeks of treatment and they maintain their treatment gains six months later (with no further treatment). These results are superior to 1st line treatment outcomes at the VA – where outcomes range from 31-42% no longer having a diagnosis.

Resiliency Services: Our very popular peer support trainings continue as well and to date, we have provided this training to over 100 police/fire/sheriff departments throughout the state of Florida as well as training 60 officers of the Florida Highway Patrol (FHP). In total, training well over three hundred peer supporters. At their request, we have even provided refresher trainings to FHP

As illustrated, RESTORES is well-aligned with the university's strategic plan. UCF has challenged its faculty to create partnerships that allow them to make a distinctive impact

on the community. We have developed several distinctive partnerships, including our partnerships with the Florida Firefighters Safety and Health Collaborative and the National Police Foundation's Center for Mass Violence Response Studies. We also provide opportunities for undergraduate and graduate training with several unique populations.

Initiative	Total
UCF RESTORES Treatment and Resiliency Programs	$500,000
Maintenace for Behavioral Health Mobile Command Center	$15,000

A. ***Continued operation of the UCF RESTORES treatment and resiliency programs $500,000***

In the last year alone, we completed over 4000 hours of therapy for Florida's veterans, first responders and survivors of mass violence (at no cost to participants). As a result of the COVID-19 pandemic, the volume of requests from the first responder community increased. This request is to cover services at our Orlando clinic. It includes salaries and fringe benefits for 4 masters level therapists, 1 care coordinator, 1 business specialist, 1 program manager, 1 resiliency training coordinator, and 2 outreach personnel. It also includes all operational costs for the clinic including electronic health record costs, maintenance of computers, printers, virtual reality equipment, consumable supplies such as diagnostic assessment materials, patient workbooks needed for treatment sessions, copy paper, telephone, etc. The request will allow the clinic to continue to function.

B. ***Maintenance costs to maintain a Behavioral Health Command Center to respond to mass violence and natural disasters and to prevent suicide contagion, $15,000***

The first few days after a mass trauma event (building collapse, major hurricane, mass shooting) is complete chaos from the behavioral health perspective. There is no coordination of providers who show up to the scene offering their services; there is no vetting of clinicians who claim that they can treat trauma. The result is that in the case of Parkland, for example, we heard from families that therapists "showed up once, heard my child's story, promised to come back/give them an appointment for continued services and then never did." In addition, well-meaning but untrained therapists provide treatment that is inappropriate to the needs of victims and their families. This is an extreme disservice to people in extreme emotional distress at the time of their greatest need. We can do better. We are seeking private funding to purchase a Behavioral Health Command Center that could respond immediately to mass violence events (such as school shootings), natural disasters (such as Hurricane Michael), or even the case of a high profile suicide (to protect from suicide contagion). Of course, we would only deploy and work in coordination with local law enforcement agencies who are running the scene.

If we had such as unit after Hurricane Michael or the Surfside Building collapse, for example, a behavioral health response would have been as follows:

- After a request for service from the command center, arrive on the site and begin triage by quickly vetting appropriateness of potential health providers and assigning them tasks, triaging affected citizens and providing needed level of psychological support.

- Provide training in psychological first aid to local clinicians
- Find clinicians already trained in evidence-based interventions and making sure that they were available to provide needed interventions and provide further training as necessary.

Our request for state funding for this project is $15,000 for yearly operational/maintenance costs such as professional driver hired to drive the unit, travel costs for driver and UCF personnel on site, fuel for the unit, and storage of the unit when not in use.

II. Return on Investment

UCF RESTORES' response to community needs is demonstrable. We are called to assist in a variety of traumatic events throughout our community, including deploying to police or fire stations when there is a first responder suicide or "bad" event. We have worked with mass shooting victims throughout the state. We continue to be the treatment center for veterans who cannot go to or do not want to go to the VA for treatment. Graduate and undergraduate students are integrated into all aspects of the treatment program, providing them with unique educational opportunities. **Seven of the Ph.D. clinical psychology doctoral students whom we have trained at UCF RESTORES are now fulltime clinicans at VAs throughout the country, four of them at VAs in Florida.**

With funding provided in prior years, we produced a web-based certificate program to train master's level clinicians who want to learn how to conduct our evidence-based treatment for veterans and first responders. We saw the need for this program firsthand, when we were requested to deploy to Parkland after the school shooting. We heard the stories of first responders, parents, and students who were unable to find therapists willing to work with them. Last year we provided over 100 scholarships to clinicians throughout Florida who were interested in providing our evidence-based treatment program, another way that we are extending our impact across the state.

Finally, in terms of return on investment, it cannot be overstated that a key outcome of RESTORES' work is to allow the state to retain its critical group of first responders by allowing them to recover from their trauma-related injuries and return to the workplace. Not only does this improve the quality of life for these heroes, it has a substantial economic impact in terms of savings from the recruitment and training of replacement personnel. It has been estimated that up to 35% of police sick-time claims are due to the consequences of stress. Similar rates have been reported for firefighters. Obviously, this results in millions of dollars in cost to the agencies. Alarmingly, this rate appears to be increasing yearly. Additionally, the National Labor Organization reports that 63% of first responders who leave the workplace cite stress as a key factor in their decision. Recruiting replacements is both difficult and costly. Many agencies are suffering from an inability to even identify qualified personnel. When replacements are found, it is estimated that the costs of training can approach $20,000 per person.

III. Personnel

This first $500,000 in requested funding is for retention of personnel who perform the essential functions at UCF RESTORES ($485,000) and basic operational costs associated with running our clinic ($15,000):

Personnel: $485,00 salary and fringe benefits:

Four (4) masters level therapists (4 FTE)

One (1) clinical care coordinator (1 FTE)

One (1) business specialist (1 FTE)

One (1) program manager (1 FTE)

One (1) resiliency training coordinator (0.5 FTE)

Two (2) outreach personnel. (0.5 FTE each)

As noted, all funding is for retention of personnel who have allowed our clinic to provide the needed training and clinical services at no cost to Florida's veterans, military personnel, first responders, survivors of sexual trauma, and survivors of mass shootings and other natural/manmade disasters. If insurance were to be billed for these services or the individual had to pay out of pocket, the cost would exceed $1 million. Thus, providing these services at no cost is a great benefit to the citizens of Florida.

IV. Facilities (*If this issue requires an expansion or construction of a facility, please complete the following table.):*

	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
(to be completed for each issue)

University: **University of Central Florida**
Issue Title: **PTSD Clinic (RESTORES)**

	RECURRING	NON-RECURRING	TOTAL
Positions			
Faculty	0.00	0.00	0.00
Other (A&P/USPS)	8.50	0.00	8.50
Total	8.50	0.00	8.50
Salaries and Benefits	$485,000	$0	$485,000
Other Personal Services	$0	$0	$0
Expenses	$15,000	$0	$15,000
Operating Capital Outlay	$0	$0	$0
Electronic Data Processing	$0	$0	$0
Financial Aid	$0	$0	$0
Special Category (Specific)	$0	$0	$0
Operational expenses of mobi	$15,000	$0	$15,000
	$0	$0	$0
	$0	$0	$0
Total All Categories	$515,000	$0	$515,000

Attachment D

State University System
Education and General
2022-2023 Legislative Budget Request
Form I

University(s):	**University of Central Florida**
Request Title:	**Lou Frey Institute**
Date Request Approved by University Board of Trustees:	
Recurring Funds Requested:	**$976,000**
Non-Recurring Funds Requested:	
Total Funds Requested:	**$976,000**
Please check the request type below:	
Shared Services/System-Wide Request	☐
Unique Request	☒

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.*

There is a renewed commitment in Florida to preparing the next generation of informed citizens and civic leaders. Led by Governor DeSantis' Executive Order calling for stronger emphasis on civic learning throughout the state's K-12 system, and recent legislation putting that commitment into practice, this renewal is built on the principle articulated by John Dewey almost 100 years ago: "Democracy must be reborn in each generation and education is its midwife."

Consider the most recent civic health data from the U. S. Census Bureau. Florida ranks:

49th in the percentage regularly voting in state and local elections;
49th in the percentage who have contacted or visited a public official;
50th in the percentage who have attended a public meeting;
48th in the percentage who volunteer;
51st in the percentage who donate at least $25 to charity;
48th in the percentage who trust people in their neighborhood; and
50th in the percentage who have worked with others to address a community issue.

Other data suggests that Floridians, like many others in the nation, are woefully uninformed about the structures and functions of the institutions that govern them and that they fail to grasp the fundamental principles upon which democratic governance rests. It is not too much to conclude that Florida's civic health is among the weakest in the country. The Governor's leadership in making John Dewey's maxim a reality in our schools is critically important for Florida's future.

UCF's Lou Frey Institute (LFI) and its partnership organization, the Florida Joint Center for Citizenship (FJCC) have, for more than a decade, worked to promote the development of enlightened, responsible, and actively engaged citizens – particularly in K-12 schools. As will be noted below, we have made consistent progress, particularly in middle school. But the Governor's Civic Renewal Initiative offers the opportunity to expand our work to include the state's 70,000 elementary teachers as well as thousands of secondary U. S. History and Government teachers. Some of that work has already begun:

- The 2017 Florida Legislature amended Section 1007.25, Florida Statutes, to require students initially entering a Florida College System institution or state university in 2018-19 and thereafter to demonstrate competency in civic literacy. At the request of the Board of Governors, LFI worked with the Florida Department of Education's to develop the statewide test that is currently being used to assess student civic literacy. In addition, LFI has also created online teacher and student resources to support implementation.

- In the 2019 Session, the Legislature adopted HB807 as a vehicle for implementing the Governor's Executive Order. Among other things, the bill called for a review of civics standards, benchmarks and instructional materials. LFI's Florida Joint Center for Citizenship was named in HB807 as an organization to collaborate with FLDOE in this process.

- Following the Governor's urging that all high school seniors take the Naturalization Test before graduation, FLDOE launched an optional pilot with select districts who wished to test their 12th graders. The test to be used in that pilot was the test the LFI developed with FLDOE for the Postsecondary civic literacy requirement. This expectation has been made into law through the recent passage of CS/CS/SB1108 in 2021.

- Two bills passed in 2021 will continue to support and drive civic education in Florida. HB5 mandates the creation of a 'Portraits in Patriotism' curricular resource and related materials, with additional expectations for what civic education should address. SB146 encourages students to engage in extracurricular projects that encourage a deeper sense of civic participation and patriotism, an approach that LFI is well positioned to support through its partnership with the Constitutional Rights Foundation.

Because of the critical importance of expanding civic learning opportunities in the state's K-12 system, the Institute is committed to seeking every opportunity to ensure the success of the governor's goal of keeping Florida as a national leader in civics education, through his Civic Literacy Excellence Initiative. Indeed, this work is the core of our mission. LFI has been working to help restore the civic mission of Florida's schools since 2006 and, in 2010, the Institute's policy analysis work made substantial contributions to the adoption of the state's Justice Sandra Day O'Connor Civics Education Act, the strongest civic education legislation in the nation. That Act requires civics instruction in middle school and, beginning in 2013, implemented a statewide 7th grade end-of-course examination that accounts for 30% of students' course grade. The O'Connor Act is making a difference in what middle school students know about and can do in civic life. In the 2018-2019 statewide test administration, 71% of 7th graders achieved a passing score, an increase of 15% since the first administration in 2013.

With a mixture of Legislative funding, grant funding and support from UCF, LFI has worked with districts, schools, teachers and students to support civic learning by providing professional development, instructional materials, assessment resources and online tools for direct student instruction. In the pre-pandemic 2019-2020 school year, for example:

- *Over 400 teachers participated in the Institute's face-to-face professional development workshops, despite the impact of various factors on in-person PD*
- *Teachers accessed the Institute's instructional website nearly 5,000 times a month for a total of approximately 59,000 online sessions that provided over 5,000 hours of professional development and curriculum support*
- *The Institute's Student Civics Review Websites, particularly Civics360, were accessed by students over 500,000 times (an average of over 41,000 online sessions per month) providing over 50,000 hours of direct student instruction. More than 200,000 students in Florida made use of the website over the course of the school year.*

The resources that LFI is providing to teachers and students are making a measurable contribution to the state's success in civic learning in middle schools. Drawing on FLDOE-provided data that permitted a comparison of all 7th grade civics teachers who used LFI instructional materials to teachers who did not. The assessment, completed in 2016 based on 2014-15 student data found that:

- *Students of teachers who did not use LFI instructional materials had a passing rate of 58.6%.*
- *Students of teachers who used at least some LFI instructional materials had a passing rate of 65.9%.*
- *Students of teachers who reported using LFI materials for at least two-thirds of required instructional benchmarks had a passing rate of 70.3%.*
- *Students of teachers who reported using LFI materials and had students utilize the LFI Civics Review Website had a passing rate of 73.3%, an increase of over 25%.*

The Sandra Day O'Connor Civic Education Act combined with the continued

success in implementing its provision and the resulting continuous improvement in student achievement has attracted interest and served as a model for many throughout the nation. To take just a few examples:

- *Since at least 2016, multiple states have looked to Florida for effective civic education models, and the Institute has served in an advisory role for key stakeholders across the country.*
- *In the fall of 2017, LFI's work in Florida was recognized with an award presented by the National Civic Learning Community at a summit held in Washington, D.C.*
- *In 2018, LFI was elected to membership in the Civics Renewal Network, hosted by the Annenberg Center at the University of Pennsylvania, as a platform to share professional development and curricular resources throughout the nation*
- *In the spring of 2018, the Institute's work in support of the implementation of the Sandra Day O'Connor Civics Education Act was the focus of a National Civic Learning Infrastructure planning summit hosted by the Edmond J. Safra Center for Ethics at Harvard University. Collaboration is ongoing.*
- *LFI has an ongoing partnership with the Center for Legislative Archives at the National Archives and Records Administration to build "Students Investigating Primary Sources;" curricular materials that encourage deeper civic learning by engaging students in understanding current public issues the exploration of selected historical documents contained in the Archives. This effort supports the work of teachers across Florida. This partnership also contributed to the development of increasingly popular online teacher professional development resources on the US Constitution and the Civil War and Reconstruction.*

Teaching in a Pandemic. The COVID-19 pandemic that struck the nation in the spring of 2020 required new ways if managing instruction. It is, moreover, not clear that the normal routines of instruction will return in the coming school year. LFI's significant investment instruction provided important resources for both teachers and their students. These include:

- *Civics360, an online instructional and review resource aligned with Florida's middle school civics benchmarks. This site saw more than 115,000 student sessions in just the three months that teachers had to do remote instruction during the pandemic.*
- *Civics in Real Life, an online resource for civics teachers that connects current events to civics concepts. Housed on the Florida Citizen website, these were accessed over 5,000 times as a part of teacher driven remote instruction.*
- *The Civics Classroom, an online teacher professional development resource which helps to address shortcomings in face to face teacher professional development as a result of the ongoing pandemic. More than 100 teachers from across Florida have registered for the course series within the first month of launch.*

Next Steps:

- **Aligning Civics Instructional and Student Learning Resources**
    - The Governor's Civic Renewal Initiative calls for a review and revision of Florida's instructional standards and benchmarks for K-12 civics

instruction. As revisions are completed. LFI will undertake a revision of its existing online instructional materials and student learning materials to align with revised instructional goals. In addition, selected new components will need to be developed to be consistent with state policy initiatives in civics. These include:

- *The development of online K-5 and 6-12 teacher professional development resources for effective implementation of the Civics Reading List developed as a core feature of Florida's new K-12 English Language Arts B.E.S.T. Standards*
- *Continued development of resources to support the implementation of the Civic Literacy Assessment at both the secondary and post-secondary level*
- *Support for the governor's Civic Literacy Excellence Initiative through additional curricular and professional development resources as requested and needed*

- **Strengthening the UCF-OCPS Civic Learning Partnership**
  - Through teacher professional development targeted to Orange County's lowest performing schools, LFI has worked to improve instruction, minimize teacher turnover and increase student achievement. Though some progress has been made, much work remains. LFI will coordinate with UCF's new College of Innovation and Education to improve civic learning opportunities for students in need throughout the Orlando region.
- **Expanding Online Capacity for Professional Development and Student Civic Learning**
  - LFI has made substantial progress in building online professional development opportunities for Florida's Civics teachers. Our capacity to be responsive to a changing online environment – due to anticipated changes in instructional goals and the Covid-19 environment are extremely limited. This request would provide additional personnel and equipment to address this deficit.
- **Analysis and Evaluation**
  - The private sector has learned that efficient processes to support effective competition in the marketplace requires constant monitoring, evaluation and adjustment of manufacturing and service processes. The same is true in education although it is difficult to realize. LFI proposes to add data management and analysis personnel that would support continuous monitoring of its activities with regular reports to the state's civic education community. We anticipate an advisory structure that would engage districts, FLDOE assessment personnel, and research colleagues from other state universities in this effort.

Relationship to UCF Mission, Vision, and Strategy. The outreach and teacher preparation work of the LFI along with continuous learning through evaluation are at the core of the university's mission to provide "pioneering scholarship and impactful research" and "highly relevant continuing education and public

service initiatives that address pressing local, state, national, and international issues…." More specifically, LFI's work makes a direct contribution to UCF's Statement of Strategy to "pursue its goals by favoring tactics that feature partnerships and interdisciplinary approaches to problems of significance to the university and the Central Florida city-state." Underscoring the importance of LFI's work in relation to this strategy, the U. S. Census data cited earlier indicates that the Central Florida city-state actually ranks lower than the state average on virtually every measure of social capital, social cohesion and citizen engagement with the community. (see http://ncoc.net/FL). Recent work by the National Academy of Sciences points to a growing body of research suggesting that communities with low levels of social capital, social cohesion, and citizen engagement may experience social tension and community fragmentation, higher crime, less resilience in managing natural disasters, negative employment and health outcomes among immigrant populations, and, in some cases, higher rates of premature death. (see *Civic Engagement and Social Cohesion: Measuring Dimensions of Social Capital to Inform Policy* at http://www.nap.edu/catalog.php?record_id=18831). Thus, strengthening the core of civic life is especially critical for the Orlando metropolitan area, the center of UCF's service region. Additionally, LFI's hundreds of working K-12 partnerships stretching from Pensacola to Key West make a significant contribution to UCF's primary goal of being America's Partnership University.

In addition, the current climate around civic engagement and social resistance suggests an ongoing need for strong civic education that restores the importance of constitutional principles and civic equality to ongoing dialogues. This aligns with UCF's mission of addressing national issues in a comprehensive and equitable way while also driving an effort towards to ensuring effective development of both cultural and economic life in Florida.

UCF's dedication to central Florida, particularly in the Parramore Education and Innovation District and its Downtown Orlando Campus, necessarily involves attention to the civic health of the area, beginning with K-12 education. The Lou Frey Institute remains dedicated to working with stakeholders in this area to improve potential civic engagement outcomes through continuous civic education support and innovation.

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.*

The Lou Frey Institute will continue to develop and provide instructional support for civic learning to teachers and students in every school district in Florida, with the primary goal of improving student learning outcomes. Please note that the data below is pre-pandemic. We expect a return towards normality for the 2021-2022 and 2022-23 year. Indicators of return on investment include:

1. Teacher utilization of online civics instructional resources, measured by
    a. The number of teachers who maintain active accounts on the Institute's Florida Joint Center for Citizenship web-sever:
        i. FY 19-20 result – 11,200 accounts
        ii. FY 22-23 target – 13,000 accounts
    b. The number of online sessions which teachers initiate to access materials:
        i. FY 19-20 result – 59,000 sessions
        ii. FY 22-23 target – 65,000 sessions
2. Student utilization of online civics instructional resources, measured by
    a. The number of students who maintain active accounts on the Institute's Civics360 web-server:
        i. FY 19-20 result – 60,000 accounts
        ii. FY 22-23 target – 70,000 accounts
    b. The number of online sessions which students initiate to access Civics 360 instructional materials:
        i. FY 19-20 result – 500,000 sessions
        ii. FY 22-23 target – 600,000 sessions
    c. The total number of hours that students utilized Civics360 instructional materials:
        i. FY 19-20 result – 50,000 hours
        ii. FY 22-23 target – 60,000 hours
3. Teacher completion of online professional development courses
    a. The number of teachers completing each course series
        i. FY 22-23 target – 200 teachers
    b. Pre-test/post-test gains
        i. FY 22-23 target – 25%
4. The civics EOC "passing rate" (scoring 3 or higher) of students whose teachers utilized LFI instructional materials compared to the passing rate of students whose teacher do not utilize LFI instructional materials:
    a. FY 16-17 result – Civics EOC pass rate for
        i. Teachers not using LFI materials – 62.1%
        ii. Teachers using LFI materials for 1 year or less – 63.4%
            1. 2% improvement
        iii. Teachers using LFI materials for 2 years – 69.1 %
            1. 11% improvement
        iv. Teachers using LFI materials for 3 years – 71.3%
            1. 15% improvement

v. Teachers using LFI materials for 4 years – 75.9%

1. 22% improvement

b. FY 22-23 – Maintain outcome effects achieved in FY 16-17

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.*

Hiring: In order to implement the goals described in Section I, a primary focus would be bringing in 3 additional personnel. One is an additional web developer to support implementation of online practices and ensuring the strength of LFI in the web-based civic space while supporting implementation of Florida civic education mandates. This would be a full time staff position, funded at approximately 70,000/yr salary and fringe. An additional staff position would center on research and data analysis to study and grow the effectiveness of LFI programs while also supporting implementation, funded at approximately 70,000/yr salary and fringe. In order to better support the broad range of development and implementation efforts, an additional instructional specialist position would be added, at approximately $80,000/yr salary and fringe.

IV. Facilities (*If this issue requires an expansion or construction of a facility, please complete the following table.):*

	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
(to be completed for each issue)

University: **University of Central Florida**
Issue Title: **Lou Frey Institute**

	RECURRING	NON-RECURRING	TOTAL
Positions			
Faculty	5.00	0.00	5.00
Other (A&P/USPS)	3.00	0.00	3.00
Total	8.00	0.00	8.00
Salaries and Benefits	$600,000	$0	$600,000
Other Personal Services	$123,000	$0	$123,000
Expenses	$253,000	$0	$253,000
Operating Capital Outlay	$0	$0	$0
Electronic Data Processing	$0	$0	$0
Financial Aid	$0	$0	$0
Special Category (Specific)	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
_____	$0	$0	$0
Total All Categories	$976,000	$0	$976,000

ITEM: BOT-2

UCF BOARD OF TRUSTEES
Agenda Item Summary
June 30, 2021

Title: Heating, Ventilation, and Air Conditioning (HVAC) Renovation Projects

☐ **Information** ☐ **Information for upcoming action** ☒ **Action**

Meeting Date for Upcoming Action: _____

Purpose and Issues to be Considered:
The university has been awarded institutional aid from federal Higher Education Emergency Relief Funds (HEERF) as a result of the pandemic. Guidance received from the Department of Education states that minor renovations and installation of HVAC systems are allowable costs to prevent the spread of COVID-19 through air filtration systems.

The purpose of this agenda item is to request approval to proceed with multiple HVAC renovation projects (Attachment A) that are allowed under federal guidnance utilizing Higher Educational Emergency Relief Funds.

Background Information:
Pursuant to the Resolution on Presidential Authority, management will recommend for Board of Trustees' prior approval any construction project (new, remodeling, site work) with a projected construction cost, in one or a series of related transactions, in an amount greater than $2 million.

Pursuant to the Board of Trustees Capital Projects Funding Certification Policy, any capital project exceeding $2 million, a written certification form must be completed and signed by the University President, the Vice President submitting the item, the Chief Financial Officer, and the General Counsel certifying that the project has been reviewed and the funding source is appropriate for the nature of the project.

Pursuant to Florida Statute 1013.61, *Annual Capital Outlay Budget*, the Board of Trustees approved the university's 2020-21 Fixed Capital Outlay Budget in September 2020. *Board Policy for University Operating, Carryforward, and Capital Outlay Budgets* requires Board of Trustees approval for capital outlay budget amendments of $2 million or greater.

Recommended Action:
Recommend approval of capital projects listed in Attachment A.

Alternatives to Decision:
1. Approval of a revised project plan which will require removal of specific HVACs from the plan or reduced project scope; or
2. Reject this item, which will not allow the projects to proceed with construction.

Fiscal Impact and Source of Funding:
The university has been awarded institutional aid from federal Higher Education Emergency Relief Funds (HEERF) as a result of the pandemic. Minor renovations and installation of HVAC systems are allowable costs to prevent the spread of COVID-19 though air filtration systems. Minor renovations have been defined by the university as 15% or less than current replacement value of the building.

Authority for Board of Trustees Action:
Section 1011.40, Florida Statutes, *Budgets for Universities*
Board of Governors Regulation 14.003 *Fixed Capital Outlay Projects – University Budgeting Procedures*
UCF *Board Policy for University Operating, Carryforward, and Capital Outlay Budgets*

Contract Reviewed/Approved by General Counsel ☐ **N/A** ☒

Contracts will be drafted and reviewed after Board of Trustees approval.

Committee Chair or Chair of the Board has approved adding this item to the agenda ☒

Submitted by:
Gerald Hector, Senior Vice President for Administration and Finance

Supporting Documentation:
Attachment A: Capital Projects Funding Certification Form
Attachment B: HVAC Executive Summaries

Facilitators/Presenters:
Gerald Hector, Senior Vice President for Administration and Finance
Duane Siemen, Assistant Vice President, Facilities Operations

Attachment A

Capital Projects Funding Certification Form

This form is required as a condition for approval by the Finance and Facilities Committee and the Board of Trustees.

Project name/description: Heating, Ventilation, and Air Conditioning (HVAC) Renovations*

Funding source(s): Higher Education Emergency Relief Funds (HEERF)

This is to certify that the above capital project which exceeds $2 million has been reviewed and approved and the type of funding for the project is authorized by state law and Board of Governors Regulations.

Alexander Cartwright — Digitally signed by Alexander Cartwright Date: 2021.06.28 17:59:23 -04'00'

President — Date

Gerald Hector — Digitally signed by Gerald Hector Date: 2021.06.28 14:53:59 -04'00' — 06/28/2021

Vice President for Administrative Affairs and Chief Operating Officer — Date

Gerald Hector — Digitally signed by Gerald Hector Date: 2021.06.28 12:00:57 -04'00' — 06/28/2021

Senior Vice President for Administration and Finance — Date

Youndy C. Cook — Digitally signed by Youndy C. Cook Date: 2021.06.28 12:23:28 -04'00'

Interim Vice President and General Counsel — Date

* Refer to page 2 for detailed project plan.

Capital Project Certification Form
Heating, Ventilation, and Air Conditioning (HVAC) Renovations

Scope of work	Cost	Existing Conditions	Enhanced Capabilities
		Logistics	
Logistics, student and faculty relocation, contingency	$2,000,000	NOTE: A portion of this amount may be added to any of the individual projects below.	
		Classroom 1	
Replace HVAC air handler units	$2,900,000	9 AHU's circa 1999, beyond ASHRAE rated life Single fan systems, no airflow if systems fail Outside air ducts & coils undersized to meet ventilation guidelines MERV 8 & 10 filters (no viral particle capture); higher MERV filters restrict airflow noticeably	9 new AHU's, meet newest energy code & UCF standards Multiple fan array systems - air will always be moving Larger outside air ducts; improved delivery of fresh air ventilation per ASHRAE 62.1 Improve filtration to MERV 14A bag filters - >90% arrest rate of virus/bacteria Design to current ASHRAE Epidemic Task Force recommended Air Changeover Rate UV-C disinfection systems factory installed in AHU's
Enhance control system		Existing Building Automation System (BAS) is native BACnet and expandable Current sensor suite is basic	Add carbon dioxide sensor in each classroom Upgrade outside airflow monitoring and control to condition and deliver more fresh air Replace and modernize all indoor air quality sensors of the BAS
		Visual Arts Building	
Replace HVAC air handler units	$3,800,000	15 AHU's circa 1990 remain, well beyond ASHRAE rated life Single fan systems, no airflow if systems fail Equipment structural failures result in untreated air circulation Outside air ducts far too small for adequate ventilation Limited air filtration capabilities - MERV 10 Improving filtration in existing units significantly restricts airflow no UV-C disinfection at the AHUs capable at these units	15 new AHU's, meet newest energy code, ASHRAE ETF & UCF standards Multiple fan array systems - air will always be moving Improved delivery of fresh air ventilation per ASHRAE 62.1 Larger Outside air ducts to bring in more ventilation, full building duct cleaning & sealing Superior MERV 14A filters Design system for maximum ventilation at MERV 14A filtration levels UV-C disinfection systems factory installed in AHU's
		Student Union	
Replace HVAC air handler units	$3,900,000	23 of existing AHU's circa 1999 - 2004, beyond end of ASHRAE rated life Single fan systems, no airflow if systems fail Very limited outside air for ventilation, poor conditioning of outside air MERV 8 & 10 filters (no viral particle capture); higher MERV filters restrict airflow noticeably	23 new AHU's, meet newest energy code & UCF standards Multiple fan array systems - air will always be moving Greatly improved conditioning and delivery of fresh air ventilation Improve filtration to MERV 14A bag filters - >90% arrest rate of virus/bacteria Design to current ASHRAE Epidemic Task Force recommended Air Changeover Rate UV-C disinfection systems factory installed in AHU's
Upgrade control system		Existing BAS is a combination of multiple vendors and multiple generations Over half the building has no BAS, runs on original pneumatic controls Very poor controllability, poor diagnostic capabilities, poor OA control Single speed, on/off system types result in poor treatment and limited delivery of fresh air	Upgrade and modernize building automation system to 1 native BACnet system of entire building Add carbon dioxide sensor in each major meeting/gathering room Significantly improve outside air monitoring, control and airflow Add variable speed capabilities to ramp up airflow as needed for ventilation
		Downtown Center for Emerging Media Building	
Replace rooftop air handler units	$3,900,000	50 remaining existing rooftop HVAC package units of various ages, all beyond ASHRAE life Single fan systems, no airflow if systems fail Poor controllability - difficult to maintain temperature and humidity Very limited outside air for ventilation, poor conditioning of outside air Limited to MERV 9 filtration (no capture rate for viral particle size) No UV-C disinfection at the AHUs capable at these units	50 new CHW RTU's, meet newest energy code & UCF standards Multiple fan array systems - air will always be moving Significantly improved indoor air quality controllability by being able to modulate chilled water Significantly improved delivery and controllability of fresh air per ASHRAE 62.1 Improve filtration to MERV 14A UV-C disinfection systems factory installed Design to achieve ASHRAE ETF recommended air change rates
Install chilled water infrastructure	$1,900,000	New DTC has a state of the art CHW plant but the CMP is not yet connected No piping, pumps or infrastructure in CMP to take advantage of CHW plant	CHW infrastructure is mandatory to replace DX RTUs with CHW RTUs CHW RTU's offer superior controllability of IAQ at significant energy savings over DX New DTC CHW plant has underutilized capacity, plan was to always add CMB to the plant
	$18,400,000		

UNIVERSITY OF CENTRAL FLORIDA

Facilities & Safety

Executive Summary

HEERF Air Quality Improvement Project – Classroom 1 Building

The Classroom 1 building (building 79, otherwise referred to below as CL1) is a candidate project site for use of HEERF funding to improve HVAC strategies to mitigate the spread of SARS-CoV-2 and other airborne health hazards. CL1 is a three-story, 99,380 square foot concrete building constructed in 2000. It houses classrooms and study areas as well as two auditoriums. It also houses the Office of Instructional Resources, the Center for Success of Women Faculty, and the Faculty Center for Teaching and Learning. This building is prioritized due to the occupant density of students and faculty in this very heavily used building.

The HVAC strategies proposed for CL1 are focused on upgrading and modernization of both the building automation system (BAS) as well as the Air Handling Units (AHUs). The HVAC system in CL1 is primarily comprised of nine AHUs that condition and supply ventilation to the building occupants. These systems are original to the building and are now beyond their ASHRAE rated useful life. The existing AHUs each have a single belt-driven fan, resulting in loss of ventilation upon failure or scheduled maintenance practices. The original outside air ducts and cooling coils are undersized for the current ASHRAE ventilation standards. The size and type of these AHUs also limits the capability to improve filtration – they were originally designed for up to MERV 10 air filters, which do not capture particles below 1 micron (such as viruses).

The replacement strategy for these AHUs is to specify multiple-fan array style systems to maximize the uptime of fan operations to deliver ventilation. Increasing the AHU cooling capacity and increasing the size of the outside air duct systems will allow for improved delivery of fresh air and will be designed to comply with the latest version of ASHRAE Standard 62.1. The units will also be specified to use MERV 14A “bag” filters, which maintain a 90% capture rate of viral and bacterial particles 0.3-1 micron in size for the life of the filter. These filters have already been adopted by the local healthcare industry and other peer organizations in our area, and we are deploying them at UCF where equipment will allow. The new AHUs will also come equipped with factory-mounted UV-C disinfection systems.

The BAS in CL1 is already a native BACnet control system that meets current UCF specifications and is expandable, so we propose upgrading and expanding the sensor suite to include additional carbon dioxide and airflow monitoring sensors. This will allow the HVAC system to dynamically adjust ventilation to meet the ASHRAE Epidemic Task Force recommended IAQ metrics for occupancy.

UNIVERSITY OF CENTRAL FLORIDA

Facilities & Safety

Executive Summary

HEERF Air Quality Improvement Project – Downtown Communication and Media Building

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The Communication and Media Building at the Downtown campus (building 906, referred to below as CMB) is a candidate project site for use of HEER funding to improve HVAC strategies to mitigate the spread of SARS-CoV-2 and other airborne health hazards. The CMB is a three-story, 130,000 square foot steel and masonry building acquired by UCF in 2004. It was originally constructed circa 1940 and expanded in 1982. It houses classrooms, studios, meeting rooms, and group work areas. It also houses the Florida Interactive Entertainment Academy, the EA Innovation Lab, and various film and digital media studios. This building is prioritized due to the occupant density of students and faculty in this very heavily used building.

The HVAC strategies proposed for the CMB are focused on upgrading and modernization of the rooftop Air Handling Units (AHUs) and supporting chilled water infrastructure. The HVAC system in the CMB is primarily comprised of 62 rooftop direct-expansion AHUs that condition and supply ventilation to the building occupants. 36 of these systems are now beyond their ASHRAE rated useful life. The existing AHUs each have a single belt-driven fan, resulting in loss of ventilation upon failure or scheduled maintenance practices. The cooling coils are undersized for the current ASHRAE ventilation standards. The size and type of these AHUs also limits the capability to improve filtration – they were originally designed for up to MERV 10 air filters, which do not capture particles below 1 micron (such as viruses). Many of these systems are equipped with single speed, on/off fan motors and compressors, resulting in poor treatment and limited delivery of fresh air.

The replacement strategy for these rooftop AHUs is to specify multiple-fan array style systems to maximize the uptime of fan operations to deliver ventilation. Converting from direct expansion to chilled water and increasing the AHU cooling capacity will allow for improved delivery of fresh air and will be designed to comply with the latest version of ASHRAE Standard 62.1. Chilled water RTUs will also have superior controllability of indoor air quality. The units will also be specified to use MERV 14A “bag” filters, which maintain a 90% capture rate of viral and bacterial particles 0.3-1 micron in size for the life of the filter. These filters have already been adopted by the local healthcare industry and other peer organizations in our area, and we are deploying them at UCF where equipment will allow. The new AHUs will also come equipped with factory-mounted UV-C disinfection systems.

The BAS in CMB is already being upgraded to a native BACnet control system that meets current UCF specifications and is expandable, and we are expanding the sensor suite to include additional carbon dioxide and airflow monitoring sensors. The BAS will also be modified to control and take advantage of using chilled water for cooling and dehumidification. Expanding the chilled water from the downtown campus plant to the CMB will also involve the addition of chilled water pumps and piping infrastructure to support the new CHW rooftop AHUs.

UNIVERSITY OF CENTRAL FLORIDA

Facilities & Safety

Executive Summary

HEERF Air Quality Improvement Project – Student Union

The Student Union (building 52) is a candidate project site for use of HEER funding to improve HVAC strategies to mitigate the spread of SARS-CoV-2 and other airborne health hazards. The Student Union is a four-story, 181,755 square foot concrete and masonry building originally constructed in 1995, with subsequent additions and expansions including the recently completed north extension. It houses dining and study areas as well as meeting rooms, ballrooms, and retail space. It also houses the Offices of Student Government Association, Student Involvement, legal services, social justice and advocacy, and other student-centric services. This building is prioritized due to the occupant density of students and supporting staff in this very heavily used building.

The HVAC strategies proposed for the Student Union are focused on upgrading and modernization of both the building automation system (BAS) as well as the Air Handling Units (AHUs). The HVAC system in the Student Union is primarily comprised of 27 AHUs that condition and supply ventilation to the building occupants. 23 of these systems are original to the building and are now beyond their ASHRAE rated useful life. The existing AHUs each have a single belt-driven fan, resulting in loss of ventilation upon failure or scheduled maintenance practices. The original outside air ducts and cooling coils are undersized for the current ASHRAE ventilation standards. The size and type of these AHUs also limits the capability to improve filtration – they were originally designed for up to MERV 10 air filters, which do not capture particles below 1 micron (such as viruses). Many of these systems are equipped with single speed, on/off motors, resulting in poor treatment and limited delivery of fresh air.

The replacement strategy for these AHUs is to specify multiple-fan array style systems to maximize the uptime of fan operations to deliver ventilation. Increasing the AHU cooling capacity and increasing the size of the outside air duct systems will allow for improved delivery of fresh air and will be designed to comply with the latest version of ASHRAE Standard 62.1. The units will also be specified to use MERV 14A “bag” filters, which maintain a 90% capture rate of viral and bacterial particles 0.3-1 micron in size for the life of the filter. These filters have already been adopted by the local healthcare industry and other peer organizations in our area, and we are deploying them at UCF where equipment will allow. The new AHUs will also come equipped with factory-mounted UV-C disinfection systems.

There is currently very limited BAS in the Student Union, and what is there is comprised primarily of original, obsolete pneumatic controls and various older generations of antiquated pre-BACnet controls, save for the most recent expansion. There is very little control or adjustability of these systems, and no remote diagnostics or monitoring capabilities. This project will fully replace the obsolete pneumatic controls and antiquated BAS controls to the same new native BACnet BAS installed in the most recent expansion. Carbon dioxide sensors will be installed in all meeting and ballrooms, as well as most common spaces and office suites. Airflow monitoring of outside air at each AHU will allow for greatly improved conditioning, control and delivery of fresh air to the Student Union.

UNIVERSITY OF CENTRAL FLORIDA

Facilities & Safety

Executive Summary

HEERF Air Quality Improvement Project – Visual Arts Building

The Visual Arts building (building 51, otherwise referred to below as VAB) is a candidate project site for use of HEER funding to improve HVAC strategies to mitigate the spread of SARS-CoV-2 and other airborne health hazards. VAB is a two-story, 85,000 square foot concrete building constructed in 1991. It houses classrooms, studios and laboratory spaces as well as an auditorium and offices for the Visual Arts department. This building is prioritized due to the occupant density of students and faculty in this very heavily used building.

The HVAC strategies proposed for VAB are focused on upgrading and modernization of the Air Handling Units (AHUs). The HVAC system in VAB is primarily comprised of 21 AHUs that condition and supply ventilation to the building occupants. All but seven of these systems are original to the building and are now beyond their ASHRAE rated useful life. The existing AHUs each have a single belt-driven fan, resulting in loss of ventilation upon failure or scheduled maintenance practices. The original outside air ducts and cooling coils are undersized for the current ASHRAE ventilation standards. The size and type of these AHUs also limits the capability to improve filtration – they were originally designed for up to MERV 10 air filters, and due to their configuration are not able to accept larger, higher efficiency filters. The original MERV 10 filters do not capture particles below 1 micron (such as viruses).

The replacement strategy for these AHUs is to specify multiple-fan array style systems to maximize the uptime of fan operations to deliver ventilation. Increasing the AHU cooling capacity and increasing the size of the outside air duct systems will allow for improved delivery of fresh air and will be designed to comply with the latest version of ASHRAE Standard 62.1. The units will also be specified to use MERV 14A “bag” filters, which maintain a 90% capture rate of viral and bacterial particles 0.3-1 micron in size for the life of the filter. These filters have already been adopted by the local healthcare industry and other peer organizations in our area, and we are deploying them at UCF where equipment will allow. The new AHUs will also come equipped with factory-mounted UV-C disinfection systems.

The BAS in VAB is already being upgraded to a native BACnet control system that meets current UCF specifications and is expandable, and we are expanding the sensor suite to include additional carbon dioxide and airflow monitoring sensors.

ITEM: BOT-3

UCF BOARD OF TRUSTEES
Agenda Item Summary
June 30, 2021

Title: Amended Five-Year Capital Improvement Plan

☐ **Information** ☐ **Information for upcoming action** ☒ **Action**

Meeting Date for Upcoming Action: _____

Purpose and Issues to be Considered:
The Five-Year Capital Improvement Plan (CIP) was approved at the June 17, 2021 Board of Trustees meeting. During the meeting, it was discussed that an alternate CIP was being evaluated.

Staff is requesting approval of amendments to the CIP that better align with the university's physical plant priorities and better align with the state of Florida's methodology for awarding PECO funds to projects. The previous CIP submission had new construction buildings as the priority. The new plan prioritizes renovation and remodeling projects. The amendments to the CIP plan include:

- Adjusting the priority of the **Biological Sciences Building Renovation** to priority #1. The renovation has an estimated total cost of $21,630,000 and the university is requesting $15,357,300 in PECO funds to support the project in Fiscal Year 2022-23. The remaining $6,272,700 will be funded through philanthropy.
- Adjusting the priority of the **Chemistry Building Renovation** to priority #2. The renovation has an estimated total cost of $10,000,000 and the university is requesting $10,000,000 in PECO funds to support the project.
- Adding the **Howard Phillips Hall Renovation** and Remodel as priority #3. The project an estimated total cost of $12,400,000.
- Adjusting the priority of the **Learning Laboratory Building** to priority #4.
- Removing the **Research II Laboratory** from the priority list.

Our interpretation of the funding methodology is that new construction projects are not weighted as heavily in the priority for funding from the state as existing buildings that can meet space requirements and have garnered external sources of funding. The Biological Sciences Building renovation meets all those requirements. The university has not received PECO funding for several years in a row.

The projects included in the CIP adhere to criteria prescribed by the Board of Governors:

1. **Remodeling/Renovation/Maintenance/Repair**
   Funds will be requested from PECO pursuant to formula as required by section 1013.64(1)(a), Florida Statutes, and should not be included by the university on the CIP – this funding will be requested as the top system issue by the Board of Governors.

2. **Projects Previously Funded by the Legislature**
   Projects previously funded by the Legislature, effective July 1, 2017, or later, should be listed next on the CIP; these are considered "Previously Funded". If a university has more than one such project, priority should be given to those projects which can be most rapidly brought to completion.

3. **Capital Renewal and Stewardship of Existing Facilities**
   a) Subsystem Requests – Each board of trustees shall prioritize capital renewal and stewardship projects for individual subsystems of existing facilities which have failed or are functioning with substantial degradation in efficiency or performing at increased cost. This must be done on a line-item basis.
   b) Multiple Subsystem Requests – Renovation of multiple subsystems of an existing facility may be requested only if approved pursuant to an Educational Plant Survey.
   c) Demolition – Funding for demolition of an existing facility may be requested only if approved pursuant to an Educational Plant Survey.

4. **New Facility Request**
   A New Facility Request must address the following demand indicators:
      a) Will it improve the national ranking of a specific college, e.g., Music, Business, etc.?
      b) Will it allow for creation of a new academic program?
      c) Will it create both new research capability and capacity, requiring material institutional support?
      d) Will it expand current course offerings?
      e) Will it address campus-wide needs?

   New Facility Requests **must also** be supported by an existing Educational Plant Survey, a business case study; and a Plant Operations and Maintenance (PO&M) Budget Amendment, showing in detail how the existing operating budget will be adjusted to address the increased PO&M costs without additional state funds. Alternatively, identify non-state funding for the new facility.

Background Information:
Pursuant to 1001.74(12), 1011.40(1), and 1013.60, Florida Statutes, each year the university must submit an updated Capital Improvement Plan (CIP) to the Board of Governors. This plan identifies projects that will be included in the three-year Public Education Capital Outlay (PECO) list and provides information to the State Board of Education for its request for capital project funding for 2022-23. The new buildings listed in the CIP represent the highest university priorities for new construction based on critical need for research space. Once submitted the Board of Governors will evaluate all universities based on the criteria above and a newly established points-based system to present a request for PECO funding to the Legislature. If the State does not approve the funds requested, the University may include the same projects on next year's CIP, or, if available may request authorization to utilize E&G carryforward funds. This document represents the university request for state funding for new construction based on highest priority, it does not represent a comprehensive Capital Plan, which would take into account all appropriate funding sources and capital renewal needs.

Recommended Action:
Approve the Amended Five-Year Capital Improvement Plan as presented in Attachment A.

Alternatives to Decision:
1. Not approve the Amended Five-year Capital Improvement Plan.
2. Recommend changes to the Amended Five-Year Capital Improvement Plan.

Fiscal Impact and Source of Funding:
Renovations to existing buildings do not require additional escrow funds from the university to fund future capital renewal and deferred maintenance. For the Biological Sciences Building Renovation, the university will commit 25% of the total project costs with private funding (donations - $5,407,500), and 4% of the total project cost with university funding (donations - $865,200).

The Plan still includes approval to spend up to $27,646,087 from available Capital Improvement Trust Funds (CITF).

Authority for Board of Trustees Action:
Florida Statute 1001.74

Contract Reviewed/Approved by General Counsel ☐ **N/A** ☒

Committee Chair or Chair of the Board has approved adding this item to the agenda ☒

Submitted by:
Gerald Hector, Senior Vice President for Administration and Finance

Supporting Documentation:
Attachment A: Five-Year Capital Improvement Plan

Facilitators/Presenters:
Duane Siemen, Assistant Vice President for Facilities Operations
Bill Martin, Senior Director, Facilities Planning and Construction

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Summary of Projects - PECO-Eligible Projects

University: University of Central Florida | Contact: Gina Seabrook (name) | 407-823-5894 (phone) | gina.seabrook@ucf.edu (email)

PECO-ELIGIBLE PROJECT REQUESTS (ONLY)

Priority No.	Project Title	Projected Annual Funding 2022-23	2023-24	2024-25	2025-26	2026-27	Academic or Other Programs to Benefit from Project	Net Assignable Square Feet (NASF)	Gross Square Feet (GSF)	Project Cost	Project Cost Per GSF	Educational Plant Survey Recommended? (Date & Rec. #)
1	BIOLOGICAL SCIENCES BUILDING RENOVATION (P,C,E)	$ 15,357,300					CIge of Sciences	68,769	116,607	$ 21,630,000	$185	6/22/2021 No. 3.1 and 4.1
2	CHEMISTRY BUILDING RENOVATION (P,C)	$ 1,000,000	$ 9,000,000				CIge of Sciences	29,336	49,073	$ 10,000,000	$204	6/22/2021 No. 3.2 & 4.3
3	HOWARD PHILLIPS HALL RENOVATION AND REMODEL (P,C)		$ 500,000	$ 11,900,000			Total Campus	33,577	64,619	$ 12,400,000	$192	6/22/2021 No. 3.4 & 4.6
4	SPACE FACILITY (P,C,E)		$ 5,319,956	$ 58,519,519	$ 5,319,956		Total Campus	100,000	150,000	$ 69,159,431	$461	6/22/2021 No. 5.2
5	PERFORMING ARTS COMPLEX PHASE II (P,C,E)			$ 3,164,520	$ 67,170,960	$ 5,164,520	CAS-CHPS	88,310	122,800	$ 77,500,000	$631	6/22/2021 No. 5.1
	Total:	**$ 16,357,300**	**$ 14,819,956**	**$ 73,584,039**	**$ 72,490,916**	**$5,164,520**						

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Summary of Projects - CITF Projects

University: University of Central Florida | Contact: Gina Seabrook (name) | 407-823-5894 (phone) | gina.seabrook@ucf.edu (email)

CITF PROJECT REQUESTS (ONLY)

Priority No.	Project Title	Projected Annual Funding 2022-23	2023-24	2024-25	2025-26	2026-27	Academic or Other Programs to Benefit from Project	Net Assignable Square Feet (NASF)	Gross Square Feet (GSF)	Project Cost	Project Cost Per GSF	University Approval Date
1	John C. Hitt Library Renovation Phase II	$ 7,301,087					Total Campus	144,097	226,506	$ 42,978,312	$190	5/2012, rev. 5/13/2019
2	John C. Hitt Library Renovation Phase IIB	$ 20,345,000					Total Campus	30,000	45,000	$ 20,345,000	$452	4/29/21
	Total:	**$ 20,345,000**	**$ -**	**$ -**	**$ -**	**$ -**						

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Summary of Projects - Supplemental Funding

University	University of Central Florida	Contact:	Gina Seabrook (name)	407-823-5894 (phone)	gina.seabrook@ucf.edu (email)

SUPPLEMENTAL FUNDING OF PECO AND/OR CITF PROJECTS (ONLY)

Priority No.	Project Title	Projected Annual Funding Year 1	Year 2	Year 3	Year 4	Year 5	Academic or Other Programs to Benefit from Project	Net Assignable Square Feet (NASF)	Gross Square Feet (GSF)	Project Cost	Project Cost Per GSF
Total:		$ -	$ -	$ -	$ -	$ -					

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: Biological Sciences Renovation

Project Address: 4110 Libra Dr, Orlando, FL 32816

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO AGENCY OBJECTIVES

The Biological Sciences Building is a reinforced concrete and masonry five-story structure (including the sub-level basement) and was built in 1975. With the addition of the annex in 2002, its size doubled to 116,607 gross square feet. This building houses two general-purpose classrooms with a combined seating capacity of 110 seats, and nine specialized teaching laboratories (BIO-COS) with a combined seating capacity of 300 seats. Research laboratories and research support spaces facilitate the sponsored research of 40 principal investigators and numerous graduate and undergraduate students from Biological Sciences (COS), Burnett School of Biomedical Sciences (COM) Genomics and Bioinformatics Cluster (OR-FCI), and Kinesiology and Physical Therapy (CHPS). Researchers in this building were awarded $12.5M in sponsored-research grants in the past three years. The rest of the building contains faculty and staff offices and conference rooms.

The Department of Biology is the greatest user of the building's instructional spaces, and has the 8th largest undergraduate program on campus, with 1,871 students in Fall 2018. In addition, the department serves thousands of non-majors through its teaching of introductory biology. The department has a well-recognized graduate program which currently supports 64 graduate students. Overall, the department comprises a balanced blend of research scientists and classroom lecturers who are committed to maintaining a diverse undergraduate curriculum and a dynamic graduate program, and engaging in contemporary research. Biology faculty have successfully trained thousands of undergraduate students for a range of biology careers, including botanists, zoologists, ecologists, and health care professionals. Furthermore, the department's broad-based curriculum provides excellent preparation for post-graduate education (e.g., medical, dental, veterinary, and graduate school). Its competitive MS and PhD programs provide contemporary training in a diverse academic environment. Many state and federal agencies, colleges, universities, environmental consulting firms, and NGOs have consistently employed its students. The Biology Department would make an even greater impact on the Central Florida region with up-to-date, optimized facilities designed to support its ability to provide broad-based science education in an engaging manner.

The university contracted with the ISES Corporation to conduct a Facilities Condition Assessment (FCA) to benchmark the condition of its E&G facilities. The ISES Corporation inspected Biological Sciences May 15, 2018 and reported the building's Facility Condition Needs Index (FCNI) at 0.47 (below average condition with major renovation required). This project request includes renovation costs for the entire building. These costs include the following scope items:

•Planning, design, permitting, and inspections
•Painting of public areas and labs
•Fire pump and controller replacement
•Fire alarm replacement, including peripherals and radio communications
•Restroom upgrades for ADA compliance
•Interior lighting replacement including ceiling grid and tile replacement
•Flooring replacement
•Building envelope repairs
•Stair egress and entrance repairs
•Exterior door replacement
•Compressed air system replacement
•Walk-in cooler condenser and evaporator replacement
•Information Technology air conditioner replacement
•Electrical panel replacement and upgrades
•Elevator modernization
•Boiler and hot water replacement and upgrades
•Replacement of building automation control systems
•Replacement or repair of HVAC distribution systems, sealing, ductwork, dampers, diffusers, etc.
•Replacement of furniture, fixtures, and equipment where necessary
•Lab upgrades where needed, such as countertop, cabinetry, and sink replacement
•Temporary staff relocation when necessary

SUSTAINABILITY AND LEED

The University of Central Florida is committed to sustainability and continued reduction of natural resource consumption in new construction projects, and renovations where applicable. As energy costs and demands continue to escalate, achieving higher levels of efficiency has become increasingly important to the university's mission. Since 2007, UCF has mandated LEED certification, with most projects achieving Gold. UCF requires specific individual LEED credits that contribute to UCF's core principles including energy efficiency, water conservation, and indoor air quality for all projects. The Facilities Planning & Construction and Utilities & Energy Services departments provide oversight for all new construction and major renovation projects, and expedite the commissioning process with the latest industry standards to ensure that the university's sustainability goals are met and operational efficiency is achieved.

Research/Laboratory

The space classification is predominately research or laboratory type, with standard classroom and office type minimized. The project will achieve LEED Gold certification with the U.S. Green Building Council (USGBC). Energy consumption will be at least 30% less than the energy standards cited in

EDUCATIONAL PLANT SURVEY

The 2021-2026 Educational Plant Survey was conducted March 5, 2021 and approved by the UCF Board of Trustees on April 22, 2021. Approval by the SUS Board of Governors is anticipated at their June 22, 2021 meeting.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value: $ -

Basis / source of valuation:

1st Year escrow deposit: $ -

Escrow funding source: E&G

Comments:

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
Total:	-		-		-

* Apply Unit Cost to total GSF based on Space Type

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost	Remodeling Projects **Only** NASF **BEFORE**	Remodeling Projects **Only** NASF **AFTER**
REMODELING / RENOVATION							
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
Total:	-		-		-	-	-
Total New Const. and/or Remodel / Renovation:	-	68769	-	116607	-		

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs Year 1	Year 2	Year 3	Year 4	Year 5	Total
Basic Construction Costs							
Building Cost (from above)	3,521,064	12,916,936					16,438,000
Environmental Impacts/Mitigation							
Site Preparation							
Landscape / Irrigaiton							
Plaza / Walks							
Roadway Improvements							
Parking : spaces							
Telecommunication							
Electrical Service							
Water Distribution							
Sanitary Sewer System							
Chilled Water System		233,278					233,278
Storm Water System		87,300					87,300
Energy Efficient Equipment							
Subtotal: Basic Const. Costs	3,521,064	13,237,514					16,758,578
Other Project Costs							
Land / existing facility acquisition							
Professional Fees	1,790,345						1,790,345
Fire Marshall Fees	65,085						65,085
Inspection Services	86,087						86,087
Insurance Consultant	43,214						43,214
Surveys & Tests	45,000						45,000
Permit / Impact / Environmental Fees	80,617						80,617
Artwork							
Moveable Furnishings & Equipment		1,895,874					1,895,874
Project Contingency	641,288	223,912					865,200
Subtotal: Other Project Costs	2,751,636	2,119,786					4,871,422
Total Project Cost:	6,272,700	15,357,300					21,630,000

PROJECT FUNDING

Funding to Date

Source *	Fiscal Year	Amount
donations	2021-22	6,272,700
		-
		-
		-
		-
	Total:	6,272,700

Total Project Cost (from above)	**Remaining Funding Need**
21,630,000	15,357,300

*
List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: Chemistry Building Renovation

Project Address: 4104 Libra Dr, Orlando, FL 32816

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO AGENCY OBJECTIVES

The Chemistry Building, a lab-sciences building constructed in 1969, is still serviced by its original building systems and is in grave need of a major renovation. The building currently serves as home to the Chemistry Department within the College of Sciences. In order for Chemistry to continue functioning as a lab-science building, it must be brought up to code and the labs modernized to ensure their compliance. The building is structurally sound; however, extensive remediation of critical and non-critical building infrastructure issues is required. Replacement of building systems will prolong the intended use of the building and avoid unnecessary and costly building system failures.

The building requires the following renovations:
•Replacement of 24 laboratory exhaust fans on the south side of the building with one dual fan system; the existing fans are obsolete, have reached end-of-life, and are not current to code.
•Replacement of 16 laboratory exhaust fans on the north side of the building with one dual fan system; the existing fans are obsolete, have reached end-of-life, and are not current to code.
•Update and modernization of lab controls to provide a more energy-efficient approach to controlling the amount of exhaust, makeup air, chilled water, and reheat required in the building.
•Replacement of all air handler units (AHU) and variable air volume systems (VAV); none meet current UCF standards.
•Replacement of boilers, pumps, and domestic hot water heat exchangers with premium efficient condensing boilers; current boilers do not meet UCF standards.
•Update electrical, generator, elevator, ADA restroom, egress stair, and limited finishes

Using deferred maintenance funds, the university has already renovated the following:
•Added fire sprinklers.
•Replaced the main electrical distribution panel.
•Repaired the domestic and acid waste piping.
•Replaced the exterior doors.
•Renovated AHU coils, recoated drain pans and floors in AHU mechanical rooms.

The following three assessments have been completed related to the Chemistry Building:
•ISES Corporation conducted a Facilities Condition Assessment (FCA) to benchmark the condition of its E&G facilities. The issues identified encompass deficiencies such as indoor air quality, fire alarms, potable water and plumbing systems, electrical service, asbestos, HVAC, lighting, building automation, utility service entrance, information technology upgrades, ADA compliance, building envelope, interior finishes, and flooring. Per ISES, the most critical issue in this building is the support systems for the teaching labs, which are outdated and need to be repaired or replaced.
•TLC Engineering conducted a life safety and building systems analysis on the building in 2015. The study evaluated the construction parameters and usage of the building's laboratories in order to assess and categorize the existing laboratories, based on their current conditions. This evaluation corroborates the FCA findings that the labs do not fully meet current codes. Specifically, they lack proper exhaust fans, gas shut off valves, generator capacity, fire suppression systems, smoke control systems, room exits, fire dampers, and have significant HVAC issues. These issues need to be addressed to ensure that the teaching and research labs meet code requirements.

SUSTAINABILITY AND LEED

The University of Central Florida is committed to sustainability and continued reduction of energy consumption in new construction projects. As energy costs and demands continue to escalate, achieving higher levels of efficiency has become increasingly important to the university's mission. Since 2007, UCF has mandated LEED certification, with most projects achieving Gold. UCF requires specific individual LEED credits that contribute to UCF's core principles including energy efficiency, water conservation, and indoor air quality for all projects. The Facilities Planning & Construction and Utilities & Energy Services departments provide oversight for all new construction and major renovation projects, and expedite the commissioning process with the latest industry standards to ensure that the university's sustainability goals are met and design parameters achieved.

Classroom/Office
The space classification is predominately class laboratory, with research labs and minimal office space. The project will achieve Gold LEED certification from the U.S. Green Building Council (USGBC). Energy consumption will be at least 30% less than the energy standards cited in ANSI/ASRHAE/IES Standard 90.1-2016 Energy Standard for Buildings, and water consumption will be at least 30% less than that of a comparable building. The project will utilize the district cooling loop for space cooling needs and look at alternative measures to provide dehumidification with the classifications of classroom and offices and related energy use. All heating and reheating will be hydronic.

Research/Laboratory
There are a significant number of research and teaching laboratories in the building. Laboratories should have continuous variable air flow valves with air flow reset capabilities and fume hoods should have SAV's, to properly track exhaust and maintain the labs slightly negative. The fume hoods should also be exhausted through high plume exhaust fans. Domestic and laboratory hot water needs shall be provided primarily by solar thermal energy.

EDUCATIONAL PLANT SURVEY

The 2021-2026 Educational Plant Survey was conducted March 5, 2021 and approved by the UCF Board of Trustees on April 22, 2021. Approval by the SUS Board of Governors is anticipated at their June 22, 2021 meeting.

The most recent UCF Educational Plant Survey (EPS) recommends the Chemistry Project as 3-2 & 4-2.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value: $ -

Basis / source of valuation:

1st Year escrow deposit: $ -

Escrow funding source: E&G

Comments:

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
Total:	-		-		-

* Apply Unit Cost to total GSF based on Space Type

						Remodeling Projects **Only**	
						NASF **BEFORE**	NASF **AFTER**
REMODELING / RENOVATION							
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
Total:	-		-		-	-	-
Total New Const. and/or Remodel / Renovation:	-	29336	-	49073	-		

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs					
		Year 1	Year 2	Year 3	Year 4	Year 5	**Total**
Basic Construction Costs							
Building Cost (from above)			8,206,200				8,206,200
Environmental Impacts/Mitigation							
Site Preparation							
Landscape / Irrigaiton							
Plaza / Walks							
Roadway Improvements							
Parking : spaces							
Telecommunication							
Electrical Service							
Water Distribution							
Sanitary Sewer System							
Chilled Water System			233,278				233,278
Storm Water System			87,300				87,300
Energy Efficient Equipment							
Subtotal: Basic Const. Costs			8,526,778				8,526,778
Other Project Costs							
Land / existing facility acquisition							
Professional Fees		1,000,000					1,000,000
Fire Marshall Fees			21,825				21,825
Inspection Services			72,183				72,183
Insurance Consultant			43,214				43,214
Surveys & Tests			45,000				45,000
Permit / Impact / Environmental Fees			48,500				48,500
Artwork							
Moveable Furnishings & Equipment							
Project Contingency			242,500				242,500
Subtotal: Other Project Costs		1,000,000	473,222				1,473,222
Total Project Cost:			9,000,000				10,000,000

PROJECT FUNDING

Funding to Date

Source *	Fiscal Year	Amount	Total Project Cost (from above)	Remaining Funding Need
		-		
		-		
		-		
		-		
		-		
	Total:	-	10,000,000	10,000,000

*
List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: Howard Phillips Hall Renovation and Remodel

Project Address: 4297 Andromeda Loop N. Orlando, FL 32816

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO AGENCY OBJECTIVES

Howard Phillips Hall (HPH), a four-story concrete and masonry structure, was built in 1969 as one of the university's original buildings. It was partially remodeled in 1990 and 2000, but requires upgrades to its building systems as well as comprehensive reconfiguration of its interior spaces. Occupants of the building, in 2020, include:
•College of Sciences - Political Science, Sociology, Anthropology, and Global Perspectives
•SDES - University Testing Center, First Year Experience, Trio Programs
•Numerous offices have been provided for Academic Affairs, the Office of Research, and the departments of History, English, Modern Languages, Philosophy, Performing Arts, and Health Management Informatics

The university contracted with the ISES Corporation to conduct a Facilities Condition Assessment (FCA) to benchmark the condition of its E&G facilities. Howard Phillips Hall was inspected April 19, 2018. ISES reported the building's Facility Condition Needs Index (FCNI) at 0.34 (fair condition normal renovations required). This renovation project includes the replacement of above-ceiling HVAC air distribution systems, ceiling and lighting replacements, reconfiguration of select areas of the building to improve the space efficiency of the floor plan, the replacement of finishes such as carpet/tile/paint, and the replacement of vertical transportation. Code upgrades include the creation of accessible and all-gender restrooms, installation of ADA-compliant stairwell and exterior handrails, dual-level drinking fountains, lever handle door hardware, and signage. In addition to the ISIS report, UCF IT recommends significant infrastructure improvements including right-sized IT closets and equipment upgrades.

SUSTAINABILITY AND LEED

The University of Central Florida is committed to sustainability and continued reduction of natural resource consumption in new construction projects, and renovations where applicable. As energy costs and demands continue to escalate, achieving higher levels of efficiency has become increasingly important to the university's mission. Since 2007, UCF has mandated LEED certification, with most projects achieving Gold. UCF requires specific individual LEED credits that contribute to UCF's core principles including energy efficiency, water conservation, and indoor air quality for all projects. The Facilities Planning & Construction and Utilities & Energy Services departments provide oversight for all new construction and major renovation projects, and expedite the commissioning process with the latest industry standards to ensure that the university's sustainability goals are met and operational efficiency is achieved.

Classroom/Office

The space classification is predominately classroom or office type, with research or laboratory type minimized. The project will achieve Gold LEED certification from the U.S. Green Building Council (USGBC). Energy consumption will be at least 30% less than the energy standards cited in ASHRAE 90.1-2010, and water consumption will be at least 30% less than that of a comparable building. The project will utilize the district cooling loop for space cooling needs and look at alternative measures to provide dehumidification with the classifications of classroom and offices and related energy use. All heating and reheating will be hydronic.

EDUCATIONAL PLANT SURVEY

The 2021-2026 Educational Plant Survey was conducted March 5, 2021 and approved by the UCF Board of Trustees on April 22, 2021. Approval by the SUS Board of Governors is anticipated at their June 22, 2021 meeting.

The most recent UCF Educational Plant Survey (EPS) recommends the Chemistry Project as 3.4 & 4.6.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value:	$ -
Basis / source of valuation:	
1st Year escrow deposit:	$ -
Escrow funding source:	E&G
Comments:	

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-

Total:	-		-		-

* Apply Unit Cost to total GSF based on Space Type

REMODELING / RENOVATION				Remodeling Projects **Only** NASF **BEFORE**	NASF **AFTER**
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
	-		-	-	-
Total:	-		-	-	-

Total New Const. and/or Remodel / Renovation:	-	33577	-	64619	-

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs Year 1	Year 2	Year 3	Year 4	Year 5	Total
Basic Construction Costs							
Building Cost (from above)				8,883,112			8,883,112
Environmental Impacts/Mitigation							
Site Preparation							
Landscape / Irrigaiton							
Plaza / Walks							
Roadway Improvements							
Parking : spaces							
Telecommunication							
Electrical Service							
Water Distribution							
Sanitary Sewer System							
Chilled Water System							
Storm Water System							
Energy Efficient Equipment							
Subtotal: Basic Const. Costs				8,883,112			8,883,112
Other Project Costs							
Land / existing facility acquisition							
Professional Fees			500,000	443069			943,069
Fire Marshall Fees				26127			26,127
Inspection Services				144527			144,527
Insurance Consultant							
Surveys & Tests				5330			5,330
Permit / Impact / Environmental Fees				52499			52,499
Artwork							
Moveable Furnishings & Equipment				729120			729,120
Project Contingency				1616216			1,616,216
Subtotal: Other Project Costs			500,000	3,016,888			3,516,888
Total Project Cost:				11,900,000			12,400,000

PROJECT FUNDING

Source *	Fiscal Year	Funding to Date Amount
		-
		-
		-
		-
		-
	Total:	-

Total Project Cost (from above)	**Remaining Funding Need**
12,400,000	12,400,000

* List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: Learning Laboratory

Project Address: Main Campus - TBD

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO AGENCY OBJECTIVES

In late 2017, UCF's Office of the Provost and Academic Affairs convened a university-wide committee to assess academic space and facility needs across campus, and to refine planning for research laboratories, teaching laboratories, and classroom space. Deans and Vice Presidents presented their 5-year visions for academic needs to the committee. Among the highest collective priorities was a need for more and better teaching laboratories and classrooms to support Science, Technology, Engineering, and Math (STEM).

UCF determined that a new innovative, interdisciplinary STEM facility could meet campus-wide needs for teaching laboratories and active learning classrooms for multiple colleges. The UCF 2021-2026 Educational Plant Survey "Needs Assessment" confirms that there remains a deficit of teaching laboratories and classrooms at UCF.

The proposed Learning Laboratory (LL) will be a 150,000 gross square foot (GSF) facility. The facility will provide 100,000 net assignable square feet (NASF) of classrooms, teaching laboratories, and office space to meet the needs of several colleges.

TEACHING LABORATORIES. New state-of-the-art Teaching Labs will replace aging, crowded teaching labs in other buildings, and provide additional space for growth and new programs. The Teaching Labs will provide an appropriate quantity of space per student station, in keeping with current code and recommendations in the Florida State Requirements for Educational Facilities (SREF).

COLLEGE OF SCIENCES (COS)
•Chemistry Teaching Laboratories (10) will be provided to replace those currently located in the 1967 Chemistry building (CHEM); and additional Chemistry Teaching Labs (2) will address current needs.
•Introductory Physics Teaching Labs (4) will replace those currently located in the 1969 Mathematical Sciences Building (MSB); and additional Physics Teaching Labs (2) will address current needs. Physics will retain several Teaching Labs in MSB to support upper level courses.
•A Mixed-Use Teaching Lab will serve both Chemistry and Biology.
•Chemistry Teaching Lab Service will be provided to replace all Teaching Lab Service in CHEM.
•Physics Teaching Lab Service will be provided to support new Physics Teaching Labs in LL. Physics will retain some Teaching Lab Service to support retained Teaching Labs in MSB.

COLLEGE OF MEDICINE, Burnett School of Biomedical Sciences (BSBS)
•Molecular Microbiology Teaching Laboratories (4) will support current needs; and additional Teaching Laboratories (2) will offset any loss of capacity that would result from even the most minor future renovations to existing BSBS Teaching Laboratories (6) located in the 20-year-old Health Sciences II building (HS II).
•Teaching Lab Service will be provided to support BSBS Teaching Labs in LL.

COLLEGE OF ENGINEERING and COMPUTER SCIENCES (CECS)
•Teaching Labs (3) will support the new Bachelor of Science in Materials Science and Engineering (MSE), introduced in Summer of 2019.
•Teaching Lab Service for MSE will be provided.

COLLEGE of COMMUNITY INNOVATION and EDUCATION (CCIE)
•A new MakerSpace will serve K-12 education programs in Science, Technology, Engineering, Arts, and Mathematics (STEAM.)
•The LL will provide a collaborative Science Teaching Laboratory for teacher education.
•See CLASSROOMS regarding the provision of Flexible Learning Studios, where active learning pedagogies can be practiced by future teachers.

GENERAL PURPOSE
•An Open Laboratory will serve as a Tutoring Center for the participating colleges; and replace a small tutoring room in CHEM.
•Additional Teaching Labs (4) will be available to serve STEM colleges that require space.

CLASSROOMS. All classrooms in the facility will be designed to support active learning pedagogies, with furniture and technology to facilitate collaboration and generous space per student station. All classrooms in the facility will be classified as General Purpose, open to the university to partially remediate UCF's classroom space deficit.
Flexible Learning Studios (7) were requested by the College of Community Innovation and Education (CCIE) for teacher education. To improve utilization, the University will use these rooms as General Purpose Classrooms when they are not in use by CCIE.
Large Lecture Halls (2) will support collaborative learning for 200 and 240 students.
•One lecture hall will be tiered to facilitate chemistry and physics demonstrations, with teaming tables oriented toward the instructor area. The students will be arranged in teams of six, with easy circulation around the tables.
•One lecture hall should be will be furnished to support teaming at round tables. This room may be divisible into two rooms by use of a mobile partition.
•Technology will support distance learning, interactive teaching, and Assistive Listening Devices (ALD) to comply with the Americans with Disabilities Act (ADA).

The large lecture hall(s) will address university and community needs for colloquia, collaboration, and public talks; as well as serving the professional learning components of CCIE.

Classrooms will be served by a shared Storeroom for use by the participating colleges, as well as Breakout and Queueing space to support the comings and goings of large numbers of students.

OFFICE. The facility will not serve as the primary home for any of the participating colleges. Office space will be provided only for personnel who are critical to the success and

safety of the facility.
•Critical Personnel (lab managers, lab techs) from all four colleges will be provided dedicated office space. Workspace will also be provided for support staff, such as a facility manager, Information Technology, and the Office of Instructional Resources.
•Touchdown workspace will be provided for teaching assistants (TAs) and faculty working in the facility but officed elsewhere.
•Several Conference Rooms will be available, including some for use as Office-Hours Rooms by TAs from the participating colleges.

This project will result in the release of outdated Teaching Laboratory and Teaching Laboratory Service space in CHEM, for renovation into classroom and office space to partially remediate UCF's deficits in these space classifications. Further, it will facilitate the release of Teaching Laboratory and Teaching Laboratory Service in MSB, to support other academic units.

SUSTAINABILITY AND LEED
The University of Central Florida is committed to sustainability and continued reduction of energy consumption in new construction projects. As energy costs and demands continue to escalate, achieving higher levels of efficiency has become increasingly important to the university's mission. Since 2007, UCF has mandated LEED certification, with most projects achieving Gold. UCF requires specific individual LEED credits that contribute to UCF's core principles including energy efficiency, water conservation, and indoor air quality for all projects. The Facilities Planning & Construction and Utilities & Energy Services departments provide oversight for all new construction and major renovation projects, and expedite the commissioning process with the latest industry standards to ensure that the university's sustainability goals are met and design parameters achieved.

SPACE CLASSIFICATIONS
The space classification is both teaching laboratory and classroom type. The project will achieve LEED Gold certification with the U.S. Green Building Council (USGBC). Energy consumption will be at least 30% less than the energy standards cited in ANSI/ASRHAE/IES Standard 90.1-2016 Energy Standard for Buildings, and water consumption will be at least 30% less than that of a comparable building. Laboratories will have continuous variable air flow valves with air flow reset capabilities. Domestic and laboratory hot water needs shall be provided primarily by solar thermal energy. The project will utilize the district cooling loop for space cooling needs and will look at alternative measures to provide dehumidification with the classifications of lab spaces and related energy use, and all heating and reheating will be hydronic.

EDUCATIONAL PLANT SURVEY

The 2021-2026 Educational Plant Survey was conducted March 5, 2021 and approved by the UCF Board of Trustees on April 22, 2021. Approval by the SUS Board of Governors is anticipated at their June 22, 2021 meeting.

The most recent UCF Educational Plant Survey (EPS) recommended the Learning Laboratory as Project 5.2.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value:	$	69,159,431
Basis / source of valuation:		
1st Year escrow deposit:	$	691,594
Escrow funding source:	E&G	
Comments:		

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
Classroom	23,900	1.5	35,850	355	12,717,429
Teaching Lab	68,600	1.5	102,900	387	39,872,721
Office	7,500	1.5	11,250	360	4,046,400
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
Total:	100,000		150,000		56,636,550

* Apply Unit Cost to total GSF based on Space Type

REMODELING / RENOVATION						Remodeling Projects **Only** NASF **BEFORE**	NASF **AFTER**
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
Total:	-		-		-	-	-

Total New Const. and/or Remodel / Renovation:	100,000	150,000		56,636,550

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs					
		Year 1	Year 2	Year 3	Year 4	Year 5	Total
Basic Construction Costs							
Building Cost (from above)				56,636,550			56,636,550
Environmental Impacts/Mitigation							
Site Preparation			1,000,000				1,000,000
Landscape / Irrigaiton					500,000		500,000
Plaza / Walks							
Roadway Improvements							
Parking : _____ spaces							
Telecommunication					1,200,000		1,200,000
Electrical Service							
Water Distribution							
Sanitary Sewer System							
Chilled Water System							
Storm Water System							
Energy Efficient Equipment							
Subtotal: Basic Const. Costs			1,000,000	56,636,550	1,700,000		59,336,550
Other Project Costs							
Land / existing facility acquisition							
Professional Fees			3,239,407				3,239,407
Fire Marshall Fees			122,385				122,385
Inspection Services			273,410				273,410
Insurance Consultant			23,387				23,387
Surveys & Tests			100,000				100,000
Permit / Impact / Environmental Fees			109,447				109,447
Artwork					100,000		100,000
Moveable Furnishings & Equipment					2,938,870		2,938,870
Project Contingency			451,920	1,882,969	581,086		2,915,975
Subtotal: Other Project Costs			4,319,956	1,882,969	3,619,956		9,822,881
Total Project Cost:			5,319,956	58,519,519	5,319,956		69,159,431

PROJECT FUNDING

Funding to Date

Source *	Fiscal Year	Amount
		-
		-
		-
		-
		-
		-
Total:		-

Total Project Cost (from above)	**Remaining Funding Need**
69,159,431	69,159,431

*

List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: Performing Arts Complex Phase II

Project Address: 12488 Centaurus Blvd, Orlando, FL 32816

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO UNIVERSITY OBJECTIVES

The Performing Arts Complex Phase II (PAC II) project is the second, and final, phase of the UCF Performing Arts Complex. UCF, the state university with the highest student enrollment in Florida, cannot meet the needs of the School of Performing Arts with its existing facilities. Currently, the Music and Theatre Departments reside in the Performing Arts Complex Phase I (PAC I), a classroom and studio structure that was constructed in 2010. Since PAC I was constructed without performance venues, PAC II will meet this critical need. Due to consistent growth of academic offerings and a substantial increase in student enrollment over the past 10 years, PAC I is operating above capacity. Performing Arts has contended with the lack of performance space in PAC I by utilizing inadequate on-campus spaces, such as lecture halls and Rehearsal Hall, a 167-seat dedicated music performance facility, and by borrowing larger and more up-to-date performance spaces from neighboring churches and schools.

In lieu of constructing multiple performance venue spaces in PAC II, the facility will be designed to provide a highly-flexible "Sound Stage," divisible and convertible into as many as four performance spaces to provide learning opportunities for traditional performances (proscenium theatre, concert hall, etc.), as well as for developing unique events for UCF's new Themed Experience program (experiential, immersive, interactive, and shareable activities). The Sound Stage will have mobile "seating wagons" and no fixed seating.

PAC II will provide teaching labs (sound stage, rehearsal studios, production shops, etc.), study space/gallery, storage, and supporting offices, and will establish a new cultural home for the School of Performing Arts. The learning spaces will be built to professional standards with the most advanced of technologies, enabling the teaching labs to be accessed, shared, and experienced on many different platforms, in addition to traditional live settings. By using technology to create an innovative laboratory experience for undergraduate and graduate students, UCF can attract and retain exceptional students, faculty, and staff, whose collective contributions will strengthen academic programs as well as promote partnerships within the community.

PAC II will enrich all UCF programs by emphasizing the critical importance of the arts in education and encouraging creativity and innovation across other academic disciplines. This convergence between the arts and other fields of academia is among the facility's most important contributions in support of UCF's vision to create opportunity through access, partnerships, interdisciplinary endeavors, and community engagement.
Students who graduate with degrees in the Performing Arts, at both the undergraduate and graduate levels, will possess the skill sets required to contribute to the local economy, by virtue of their marketability as employees in the field of entertainment. The College of Arts and Humanities has recently introduced a new Themed Experience track in the Theatre Masters of Fine Arts program as well as the Masters of Science program.. Located in the "Theme Park Capital of the World," UCF is uniquely positioned to meet a growing demand for a skilled workforce, forward-thinking research, and creative ideation in the Themed Experience industry.

The benefits of completing the Performing Arts Complex, with the construction of PAC II, will extend well beyond the UCF campus. The spaces will attract regional community activities to campus, a potential boon to the local economy.
•Because of Orlando's prominence as an international tourist destination, PAC II will help UCF students and faculty expand their reach, and promote greater international recognition for the university.
•PAC II will enhance collaborations with community-based industry partners, such as Disney World, Universal Studios, and Cirque du Soleil; and open the door to other creative partnerships.
•Community-based partner organizations, such as the Orlando Philharmonic, Orlando Shakespeare Theater, and Orlando Repertory Theatre will be able to use PAC II technologies and venues, as they support UCF's graduate programs.
•PAC II would assist UCF in meeting state performance goals (skilled graduates earning competitive wages) and align with the UCF Collective Impact Strategic
Plan goal of transforming lives and livelihoods through UCF's impact on students and the communities it serves.
Space needs and project costs for PAC II were determined as follows: First, a preliminary needs-evaluation and design concept was prepared by a prominent local architecture firm and a theatrical consulting firm. UCF then developed a "summary of required spaces" that aligned with space categories used by the SUS. Finally, a local contracting firm prepared a detailed cost estimate, including "extraordinary costs that are not directly related to the facility" (utility extension from the UCF
District Energy Plant and IT upgrades).

The building program for the facility has been approved by the university President. In 2019, student government expressed their support for the project, as evidenced by the student led CITF committee allocating $2M of CITF funds to the design efforts of the project. The UCF Board of Trustees has also approved the use of these funds, as well as $750K of donations, to be spent on design and preconstruction efforts.

The use of the performance space as Auditoria will be far less frequent than its use as learning space; therefore, performance, rehearsal, and production spaces will be classified as Instructional space (Teaching Labs) where students will learn all facets of the design, production, and staging of performances such as plays, musicals, concerts, and themed events. A large portion of lobby and gallery space will be used as Study space.

SUSTAINABILITY AND LEED

The University of Central Florida is committed to the efficient use of natural resources. As energy costs and demands continue to grow, achieving energy efficiency has become increasingly important to the university's mission. Appropriate policies and procedures that govern the use of environmental resources and facilities have enabled UCF to achieve the improvements necessary to ensure a productive environment for all and establish itself as a national leader in energy research, education, and stewardship.

The project will achieve LEED Gold certification with the U.S. Green Building Council. Energy consumption will be at least 30% less than a comparable building. Water consumption will be at least 50% less than a comparable building. The project will utilize the district cooling loop for space cooling needs.

EDUCATIONAL PLANT SURVEY

The 2021-2026 Educational Plant Survey was conducted March 5, 2021 and approved by the UCF Board of Trustees on April 22, 2021. Approval by the SUS Board of Governors is anticipated at their June 22, 2021 meeting.

The most recent UCF Educational Plant Survey recommends the Performing Arts Complex Phase II as Project 5.1.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value: $ 77,500,000

Basis / source of valuation:

1st Year escrow deposit: $ 775,000

Escrow funding source: E&G

Comments:

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
Teaching Lab	49,335	1.5	74,003	435	32,191,088
Study	6,400	1.4	8,960	333	2,985,472
Office	2,485	1.5	3,728	346	1,289,529
Audio/Exhib.	28,060	1.2	33,672	410	13,805,520
Other	2,030	1.2	2,436	315	767,340
	-		-		-
	-		-		-
	-		-		-
	-		-		-
	-		-		-
Total:	88,310		122,798		51,038,948

* Apply Unit Cost to total GSF based on Space Type

						Remodeling Projects **Only**	
						NASF **BEFORE**	NASF **AFTER**
REMODELING / RENOVATION							
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
	-		-		-	-	-
Total:	-		-		-	-	-
Total New Const. and/or Remodel / Renovation:	88,310		122,798		51,038,948		

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs					Total
		Year 1	Year 2	Year 3	Year 4	Year 5	
Basic Construction Costs							
Building Cost (from above)					51,038,948		51,038,948
Environmental Impacts/Mitigation							
Site Preparation					1,500,000		1,500,000
Landscape / Irrigaiton					800,000		800,000
Plaza / Walks					587,550		587,550
Roadway Improvements							
Parking : spaces							
Telecommunication					1,500,000		1,500,000
Electrical Service					600,000		600,000
Water Distribution					350,000		350,000
Sanitary Sewer System					350,000		350,000
Chilled Water System					2,500,000		2,500,000
Storm Water System					800,000		800,000
Energy Efficient Equipment					700,000		700,000
Subtotal: Basic Const. Costs					60,726,498		60,726,498
Other Project Costs							
Land / existing facility acquisition							
Professional Fees	2,750,000			2,414,520			5,164,520
Fire Marshall Fees					165,133		165,133
Inspection Services					974,435		974,435
Insurance Consultant					35,602		35,602
Surveys & Tests					100,000		100,000
Permit / Impact / Environmental Fees					119,292		119,292
Artwork					100,000		100,000
Moveable Furnishings & Equipment					1,200,000	5,164,520	6,364,520
Project Contingency					3,750,000		3,750,000
Subtotal: Other Project Costs	2,750,000			2,414,520	6,444,462	5,164,520	16,773,502

Total Project Cost:		67,170,960	77,500,000

PROJECT FUNDING

Funding to Date

Source *	Fiscal Year	Amount
CITF	2021-22	2,000,000
Donations	2021-22	750,000
		-
		-
		-
		-
	Total:	2,750,000

Total Project Cost (from above)	**Remaining Funding Need**
77,500,000	74,750,000

*

List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.

State University System
5-Year Capital Improvement Plan (CIP)
FY 2022-23 through 2026-27

Project Detail

University: University of Central Florida Project Title: John C. Hitt Library Renovation Phase IIB

Project Address: 12701 Pegasus Drive Orlando, FL 32816

PROJECT NARRATIVE

PURPOSE, NEED, SCOPE, RELATIONSHIP OF PROJECT TO AGENCY OBJECTIVES

The John C. Hitt Library, built in 1967 when enrollment was 1,948 students, and expanded in 1984, is woefully inadequate to meet the needs of current and future student populations. The existing library, with a collection of over 1.3 million print volumes, is open 105 hours per week (pre-COVID), and had a pre-COVID patron count of almost 1.25 million visits per year. During a typical midterm week, 41,000 people visit the library. The existing library had 1,903 public seats pre-Phase IA construction, which represents about 4.9% of the main campus FTE, a low ratio for university libraries.

The university contracted with the ISES Corporation to conduct a Facilities Condition Assessment (FCA) to benchmark the condition of its E&G facilities. The John C. Hitt Library renovation will address both critical and non-critical issues identified in the FCA. These issues encompass deficiencies such as indoor air quality, fire alarm modernization, potable water and plumbing distribution systems, electrical service, asbestos, HVAC modernization, lighting upgrades, building automation, ADA compliance, building envelope repairs, interior finishes, flooring, egress, exterior lighting, and utility service entrance upgrades. Information technology upgrades are also required in order to meet current and future requirements.

When completed, the renovated and expanded facility will include flexible interior spaces featuring greatly increased seating, more collaboration spaces, expanded library instruction rooms; triple the number of group study rooms; a 24/5 study area; a digital initiatives center; additional Special Collections and University Archives space; graduate study space; dedicated space for campus academic partners such as SARC and the Writing Center; quiet study areas; and more than twice the number of technology workstations. The building will integrate advances in technology seamlessly with library services and collections. The renovation will also upgrade existing HVAC, electrical, and water systems – most of which are original to the building.

Phase IIB of the Library project consists of the full renovation of the second floor of the library. When reconstructed, this floor will include a new library technology lending desk, an upgraded café, a student academic resource center, and considerable student seating and group study rooms. The renovation will require the following scope:
•Demolition of the entire floor back to structure
•New HVAC, electrical, plumbing, air distribution, fire alarm, and sprinkler systems
•New ceilings, lighting, painted walls, and floor finishes
•Upgraded ADA restrooms
•New furniture for student and staff use
When fully completed, this project will provide approximately 3,500 public seats, about 9.1% of main campus FTE.

SUSTAINABILITY AND LEED

The University of Central Florida is committed to sustainability and continued reduction of natural resource consumption in new construction projects, and renovations where applicable. As energy costs and demands continue to escalate, achieving higher levels of efficiency has become increasingly important to the university's mission. Since 2007, UCF has mandated LEED certification, with most projects achieving Gold. UCF requires specific individual LEED credits that contribute to UCF's core principles including energy efficiency, water conservation, and indoor air quality for all projects. The Facilities Planning & Construction and Utilities & Energy Services departments provide oversight for all new construction and major renovation projects, and expedite the commissioning process with the latest industry standards to ensure that the university's sustainability goals are met and operational efficiency is achieved.
The project will achieve Gold LEED certification from the U.S. Green Building Council (USGBC). Energy consumption will be at least 30% less than the energy standards cited in ANSI/ASRHAE/IES Standard 90.1-2016 Energy Standard for Buildings, and water consumption will be at least 30% less than that of a comparable building. The project will utilize the district cooling loop for space cooling needs and look at alternative measures to provide dehumidification with the classifications of classroom and offices and related energy use. All heating and reheating will be hydronic.

CLASSROOM/OFFICE/STUDY
The space classification is predominately open seating, group study rooms, stacks, or office type.

EDUCATIONAL PLANT SURVEY

The Educational Plant Survey was conducted October 6-7, 2015 and approved June 2016.

1% RESERVE ESCROW [per F.S. 1001.706 (12) c.] This pertains to PECO projects only, not CITF

Building / project value:	$ -
Basis / source of valuation:	
1st Year escrow deposit:	$ -
Escrow funding source:	E&G
Comments:	

BUILDING SPACE DESCRIPTION

Space Type (per FICM)	Net Assignable Sq. Ft. (NASF)	Net-to-Gross Conversion Factor	Gross Sq. Ft. (GSF)	Unit Cost * (per GSF)	Building Cost
NEW CONSTRUCTION					
Study	30,000	1.5	45,000	353	15,873,750
	-		-		-
	-		-		-
	-		-		-

			-	-	-	
			-	-	-	
			-	-	-	
			-	-	-	
			-	-	-	
			-	-	-	
Total:	30,000		45,000		15,873,750	

* Apply Unit Cost to total GSF based on Space Type

REMODELING / RENOVATION					Remodeling Projects **Only** NASF **BEFORE**	NASF **AFTER**
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
			-	-	-	-
Total:	-		-		-	-
Total New Const. and/or Remodel / Renovation:	30,000		45,000		15,873,750	

PROJECT COMPONENT COSTS & PROJECTIONS

	Costs Funded to Date	Projected Costs Year 1	Year 2	Year 3	Year 4	Year 5	Total
Basic Construction Costs							
Building Cost (from above)		15,873,750					15,873,750
Environmental Impacts/Mitigation							
Site Preparation							
Landscape / Irrigaiton							
Plaza / Walks							
Roadway Improvements							
Parking : spaces							
Telecommunication							
Electrical Service							
Water Distribution							
Sanitary Sewer System							
Chilled Water System							
Storm Water System							
Energy Efficient Equipment							
Subtotal: Basic Const. Costs		15,873,750					15,873,750
Other Project Costs							
Land / existing facility acquisition							
Professional Fees		900,000					900,000
Fire Marshall Fees		36,188					36,188
Inspection Services							
Insurance Consultant							
Surveys & Tests							
Permit / Impact / Environmental Fees		110,000					110,000
Artwork							
Moveable Furnishings & Equipment		2,701,312					2,701,312
Project Contingency		723,750					723,750
Subtotal: Other Project Costs		4,471,250					4,471,250
Total Project Cost:		20,345,000					20,345,000

PROJECT FUNDING

Source *	Funding to Date Fiscal Year	Amount	Total Project Cost (from above)	Remaining Funding Need
Total:		-	20,345,000	20,345,000

* List any prior PECO funding. Also, for non-PECO funding sources (i.e. donations, auxiliary, C&G, etc), list each source and the entire anticipated ($) amount. See Instructions for further detail.