COLLEGE OF ENGINEERING & COMPUTING

2025 STRATEGIC PLAN

FIU

⌐PREAMBLE

No. 39

TOP 50 among public universities for the online master's engineering program, according to 2021 *U.S. News & World Report.*

Now more than ever, engineers, computer scientists, and construction professionals are addressing grand challenges that require collaboration across previously siloed disciplines.

Our college is home to more than 7,000 highly diverse engineering and computing students, including over 1,000 graduate students; many of them are anxious to be part of this rapidly changing information age. In the academic year 2020, we produced nearly 1,700 engineers and computer scientists and contributed 28% of the research doctoral degrees produced at FIU.

Powered by $45M in annual research awards and $270,000 research spending per faculty, we are growing our impact in the critical research areas identified in the four thrust areas of infrastructure and resiliency, information technology and security, health and clean energy. To accommodate our growth, we are expanding our footprint with a new engineering building to better prepare the next generation of professionals working at the interface of technology and society needs. The future of our graduates—and our communities—will be increasingly determined by creative and critical thinking, and by collaboration across disciplines.

As noted by the World Economic Forum, in reference to the Fourth Industrial Revolution, *"the speed, breadth, and depth of this revolution are forcing us to rethink how countries develop, how organizations create value, and even what it means to be human."* Our college and university remain at the forefront of these shifts that drive economic and demographic landscapes. Guided through the CEC 2025 strategic plan, we are aligning ourselves to maximize our impact in support of FIU's mission for high-quality education, research of critical need to the nation, and collaborative engagements with national and international reach.

John L. Volakis
Dean

1 https://www.weforum.org/focus/fourth-industrial-revolution

VISION & MISSION
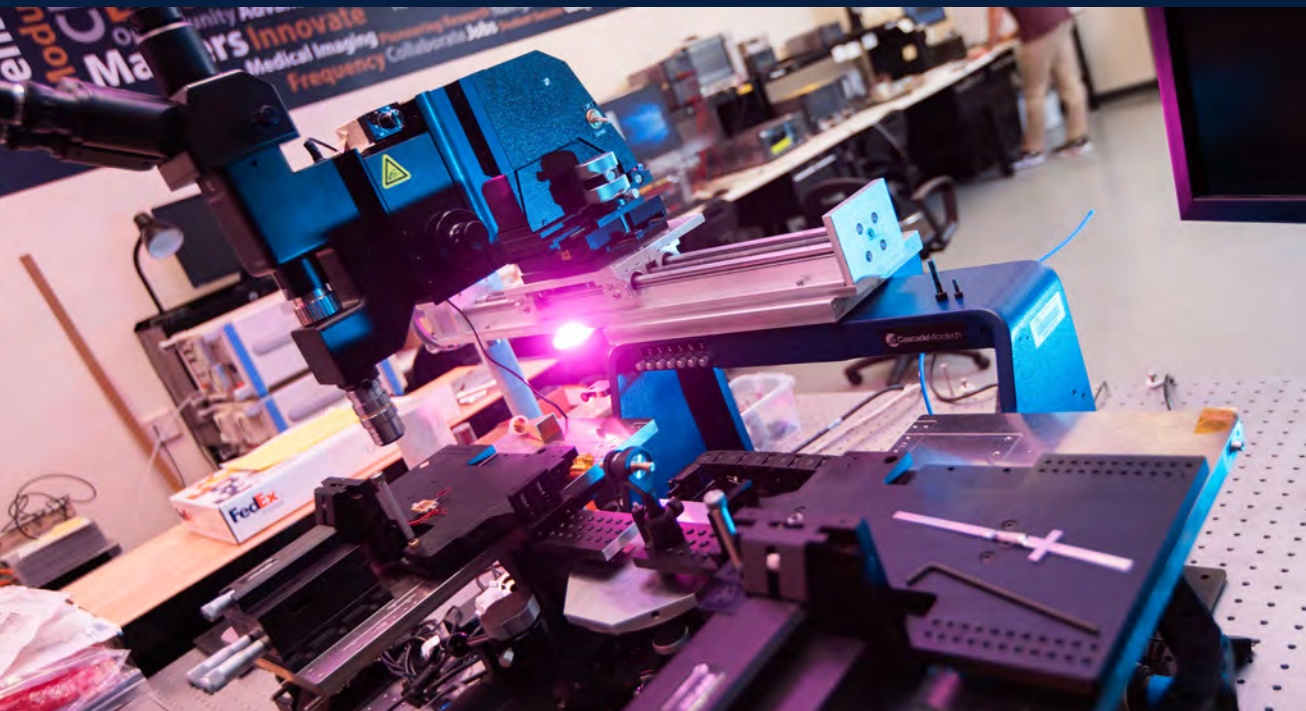
Our vision is to be a top 50 public engineering and computer science college in the nation and a global leader in educational innovation, research, and entrepreneurship. We are a new-era university offering new degrees and programs to prepare students for lifelong learning to enable Florida's and the nation's economic growth during the Fourth Industrial Revolution. We are committed to serve our students and enable them to pursue their dreams, enrich their lives and make them proud of their Panther heritage.

Our mission is to explore and introduce new frontiers in engineering and computer science and reach preeminence in the classroom, laboratory and industry:

- Classroom: Prepare students for future careers by offering degree programs that address our nation's most urgent and emerging needs.
- Laboratory: Explore and introduce new frontiers in engineering and computing, and foster innovation and interdisciplinary research that leads to entrepreneurial pursuits, primarily by providing engineering and computing solutions in grand challenge areas.
- Industry: Partner with industry to support tech transfer and innovations, enhance post-graduation opportunities for our students.

STRATEGIC PLAN
OVERVIEW

Our university's Next Horizon vision for 2025 is to **"achieve exceptional student-centered learning and upward economic mobility, produce meaningful research and creative activities, and lead transformative innovations locally and globally, resulting in recognition as a Top-50 public university."** Our vision is to brand name the College of Engineering & Computing (CEC) as national and focal points for providing engineering and computing solutions for identified research thrust areas.

The CEC 2025 strategic plan is aligned with FIU's Next Horizon 2025 vision of **becoming a top-50 public university** in student success and transformative research. It calls for the participation of an agile, collaborative, forward-looking and highly adaptive faculty and professional staff to achieve critical performance indicators for 2025 (as shown on page 6) and to be recognized as a top 50 public college in engineering and computing.

The document was developed by a committee, composed of 15 faculty and staff members across the college and university and is divided into three main sections: a) Learner Success & Institutional Affinity, b) Preeminence, Research and Innovation Impact, and c) Responsible Stewardship of Our Resources. Each section includes a set of **strategic goals** that CEC will strive to achieve, along with **key action items and pathways** for our departments and schools to implement, and **measurable metrics** to track our progress. The plan also presents a framework to ensure that all investments are made in support of becoming a top 50 public college. Our actions and metrics are focused on this goal while creating a sustainable work environment to safeguard our most important asset: our employees.

CRITICAL PERFORMANCE INDICATORS

Line #	Metric #	Next Horizon 2025 Strategic Plan Metrics	2019-2020 FIU Actuals	2025 FIU Goal	2019-2020 CEC Actuals	2025 CEC Goals
1	1	FTIC 2-yr retention rate (GPA > 2.0) (2018-19 cohort)	88.1%	90%	93%	90%
2	2	FTIC 6-yr graduation rate (2014-15 to 2019-20)	65%	70%	57%	65%
3		FTIC 4-yr graduation rate (2016-17 to 2019-20)	49%	60%	35%	55%
4	New	FTIC 6-yr graduation rate for Pell students (2014-15 to 2019-20)	68.9%	-	58%	65%
5	3	AA Transfer 4-Yr graduation rate (2016-17 - 2019-20)	73.7%	70%	62%	60%
6	4	Percent bachelor's degree without excess hours	78%	80%	63%	65%
7	5	% Bachelor's grads employed ($25K)/enrolled (2017-18)	70.9%	73%	65%	70%
8	6	Bachelor's degrees in strategic emphasis (2019-20)	50%	50%	1,238	1,500
9	7	Graduate degrees in strategic emphasis (2019-20)	59%	60%	403	500
10	8	Average cost to student/net tuition (2018-19)	$8,670	$9,000	$5,857	$5,857
11	9	Median wages of bachelor's employed (2017-18 Grads)	$39,800	$41,000	$56,125	$57,809
12	10	Number of postdoctoral appointees supported	260	300	21	25
13	11	Research/Total doctoral degrees per year	194/430	315/600	54	70
14	12	FIU Tech Startup (AUTM)	4	5	4	5
15	13	Number of patents/licenses executed annually	62/8	55/30	41/AUTM Data [7]	41/AUTM Data [7]
16	14	Philanthropy – overall endowment	$216.4M	$300M	$18.5M	$21.5M
17		Amount of philanthropy – Annual dollars raised	$67.4M	$80M	$5.1M [8]	$6M
18	15	Auxiliary revenue per year	$241M	$240M	$6M	$8.5M
19		Auxiliary income	$29M	$50M	$260K	$312K
20	16	Total research expenditures [1,2]	$226M	$300M	$34.5M	$45M
21	17	Disciplines in the top 100/50 in research expenditures [3]	6/3	7/3	5/2	5/3
22	18	Members of National Academies, including NAI *Members of National Academies, Societies or Fellowships: NAE, NAS, NAI, SPIE, IEEE, etc.* [4]	14	20	3 (28)	4 (35)
23	19	% alumni giving annually to FIU	4.9%	18%	4.6%	15%
24	20	Top 50 public university national ranking [5]	5	10	5	8
25	CEC-1	Number of Ph.D. students supported through grants	N/A	N/A	133	200
26	CEC-2	Number of PhD advising per tenure/tenure-track faculty	N/A	N/A	3.1	4
27	CEC-3	Number of PhD students enrolled in degrees with strategic emphasis	N/A	N/A	338	400
28	CEC-4	Number of tenure/tenure track faculty	N/A	N/A	117	154
29	CEC-5	Number of Early Career and PECASE [6] awards (Total recipients/number of awards per year)	N/A	N/A	17/2	27/3
30	CEC-6	Lead or serve as a member of consortium-like center (e.g., ERC, STC, MURI)	N/A	N/A	3	6
31	CEC-7	Number of fellowships awarded to Ph.D. students	N/A	N/A	31	46
32	CEC-8	Total research funding received [1]	N/A	N/A	$51.2M	$67M

Note: Metrics that are CEC-specific are numbered as <u>CEC-1 – CEC-8</u>.
[1] CEC numbers include Applied Research Center (ARC) numbers
[2] CEC numbers include non-grant spending to support research
[3] CEC numbers include rankings by NSF-HERD survey: In FY2020 two CEC programs in the top 50 research expenditures were civil engineering (*#32 in Federally financed higher education R&D expenditures in engineering subfields category*) and computer sciences (*# 42 in Higher education R&D expenditures, ranked by all R&D expenditures category*). Five programs in the top 100 ranking include all engineering (94), biomedical engineering (80), and electrical engineering (66) in the Federally financed higher education R&D expenditures in engineering subfields category and the two programs referenced above.
[4] Fellows: IEEE (5), AIMBS (4), NAI (4), AAAS (4), NAE (3), ASME (3), BMES (1), AAM (1), SPIE (1), ACM (1), ASCE (1)
[5] Source FIU AIM/rankings portal
[6] Presidential Early Career Award for Scientists and Engineers
[7] FIU Tech Startup (AUTM)
[8] Total private gifts raised without state match in FY2020

STRATEGIC PLAN ADOPTION, IMPLEMENTATION AND PROGRESS

CEC's 2025 strategic plan shares FIU's commitment to quality teaching, learning and impactful research, using data to gauge performance and progress, and continuous improvement on the efficiency and effectiveness of our operations. CEC's strategic plan also identifies several research-thrust areas for brand naming the FIU's College of Engineering & Computing.

To ensure the new strategic plan is embraced and implemented by our faculty and staff, the CEC 2025 Strategic Plan committee will launch a college-wide education campaign in FY2021 through townhalls, faculty, staff meetings, and all applicable digital communication platforms. The goal is to engage with each school and department to communicate the strategic plan. The committee will also meet once every three months (or as needed) and partner with faculty in our schools, departments to facilitate and foster progress toward reaching 2025 goals and to make recommendations with supporting data. The goal is to ensure our college remains flexible and ever-adapting to the regional, national and global changes driven by technological, economical and institutional forces.

1. Amplify Learner Success & Institutional Affinity

The demand for engineering and computing degrees are growing. Notably, our undergraduate student population has grown 36% between Fall 2017 and Fall 2020, an indication of the popularity of engineering and computing degrees at FIU. We have awarded more than 1,200 bachelor's degrees in AY2019-20, a 25% increase from three years ago, and nearly 400 M.S. & Ph.D. degrees in AY2019-20.

As engineering and computing encompass rapidly changing fields, it is essential that upper-division coursework reflect the latest technologies and team-oriented work experiences. Of importance is to ensure our students have cross-disciplinary opportunities and are taught and mentored by faculty at the cutting edge of their research and expertise. We must, therefore, enhance faculty engagement with our students as well as provide opportunities for optimized student learning, using evidence-based approaches that improve educational outcomes.

We also recognize that our students have different strengths. They are known for academic achievements and perseverance. Concurrently, a growing number of our students also work, and they have obligations beyond the school. Therefore, it is important to provide different pathways for them to succeed. That is, we must give them the attention and support they need with essential advising, mentoring, tutoring, financial assistance, and career services, not only while they are in school, but also after graduation through continuous engagement and participation in alumni activities.

By embracing these goals, we shall prepare our students for success to tackle problems of the future and fulfill the need for next-era jobs to pave the way for strong institutional affinity. To achieve these objectives, the college will pursue the following goals:

- **Strategic Goal 1:** Ensure pathways for speedy graduation of all admitted students.

- **Strategic Goal 2:** Ensure students take optimal paths to graduation.

- **Strategic Goal 3:** Ensure that their curricula are appropriate for 21st-century engineering and computing.

- **Strategic Goal 4:** Ensure that student transitions to their academic programs are smooth and timely.

- **Strategic Goal 5:** Enhance teaching.

- **Strategic Goal 6:** Increase job placement services for graduates by reimagining career services.

- **Strategic Goal 7:** Increase alumni affinity.

Specific Action Items:

I. Curriculum & Course Scheduling

1) Continue the modernization of the curricula and remove unneeded barriers.

2) Promote course flexibility by moving some core courses to electives when appropriate, leveraging courses from other units, and merging courses as needed in the junior year to ensure more flexibility for the senior year.

3) Ensure curriculum adaption of new senior courses to stay competitive with technologies of the future and industry needs.

4) Update curriculum to ensure AA (Associate in Arts) students can graduate with *N*-60 credits.

5) Recognize internships and other life experiences for credit.

6) Use A/B/C semester scheduling for sequenced courses.

7) Expand summer and online offerings for students, including labs. Utilize hybrid remote teaching modes to ensure students complete gateway and critical courses as soon as possible.

8) Promote existing alternative calculus-free degree programs and create additional degree programs for a 21st-century workforce.

Measurable Metrics:

a) FIU Performance Indicators:

- Six-year graduation rate for all FTIC students (65% by 2025).

- Four-year graduation rate for full time FTIC students (55% by 2025).

- Four-year graduation rate for all AA transfer students (60% by 2025).

- Second-year retention rate for all FTIC students (90% by 2025).

- Percentage of students graduating without excess hours (65% by 2025).

b) College and Unit-Specific Outcomes:

- 100% of all degree programs incorporate co-op experience towards degree requirements by 2025.

- 100% of all degree programs will meet the N-60 transfer rule by 2023.

- Increase in online Student Credit Hours (increase by 20% by 2025).

- Increase in summer Student Credit Hours (increase by 20% by 2025).

- Percentage of Student Credit Hours for fall/spring courses taught in A or B (20% by 2025).

- Double the number of Accelerated Bachelor's/Master's Degree Pathways students by 2025.
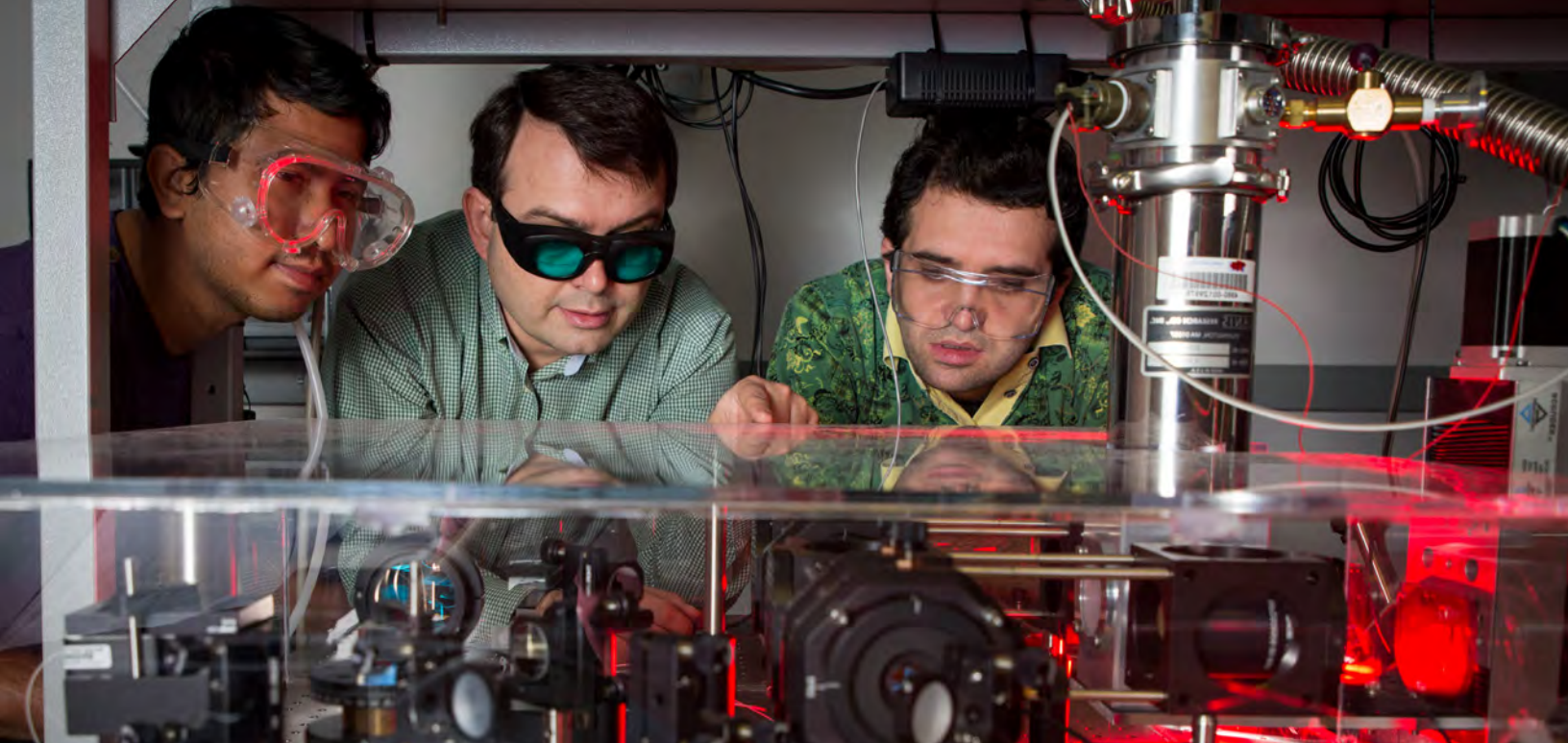
Specific Action Items:
II. Teaching and Mentoring

1) Hold workshops for faculty relating to teaching methods or scholarly production with the university's teaching-focused organizations.

2) Promote faculty participation in education-focused conferences.

3) Prioritize demonstrated teaching excellence, *other than SPOT surveys*, in tenure and promotion decisions for tenured-tenure track faculty, and in promotion decisions for teaching faculty.

4) Promote grant funding to support faculty course redesign incentives.

5) Promote training of all graduate teaching and research assistants in pedagogy and promote teaching certifications for graduate students.

6) Increase project-based and active learning with new classrooms in support of these activities.

Measurable Metrics:
College and Unit-Specific Outcomes:

• Increase in the number of courses using project-based and/or active learning by 20% by 2025.

• 100% of all graduate TAs have some training by 2025.

• 25% of tenure-track and 50% of non-tenure-track faculty to attend in-house workshops on teaching and education.

• Increase in number of faculty presentations at education-focused conferences by 100% by 2025.

• Increase in the participation in COACHE or similar surveys to highlight the value of teaching.

Specific Action Items:
III. Student Support Programs & Services

1) Ensure excellent advising support with adequate cross-training to handle all majors.

2) Redirect students timely and identify early alerts to provide student support.

3) Expand tutoring programs and centralize them under the Center for Diversity and Student Success in Engineering & Computing (CD-SSEC).

4) Work with the Advancement Office to fund completion scholarships and emergency aid for students.

5) Increase college-wide participation in FIU's Ignite campaign and encourage units to leverage Ignite funds to provide financial assistance to our students.

6) Establish or identify financial resources, including fellowships and scholarships, within units to cover full or partial student expenses (i.e., registration, travel costs).

7) Incorporate new technologies, including digital resources and adaptive learning to enhance student success.

8) Expand dual degree enrollment through CD-SSEC.

Measurable Metrics:
College and Unit-Specific Outcomes:

• Increase in number of Student Credit Hours for dual enrollments by 20% by 2025.

• Increase in advisor to student ratio.

• Double the percentage of PhD students who are Florida residents by 2025.

• Double the dollar amount of scholarships and emergency aid awarded to undergraduate students directly through CEC via Ignite and other sources.

Specific Action Items:
IV. Job Placement of Students & Alumni

1) Promote a new college-wide industry/corporate relations protocol for mutually beneficial company/industry relationships.

2) Engage with companies capable of hiring more than 10 students a year by developing MOUs and rubrics for collaborative talent development, early talent identification, and preparation.

3) Leverage new or existing partnerships with national STEM organizations, i.e., GMiS, SHPE, Grace Hopper, SWE, NSBE, as well as FIU events to promote student participation, recruitment and FIU recognition.

Measurable Metrics:
College and Unit-Specific Outcomes:

- Increase in the number of measured internships and co-ops by 200% by 2025.

- Increase in the number of companies hiring 10+ students annually, including for internships.

- Increase in the number of students hired into positions.

- Increase in the number of companies that have established MOUs for student employment opportunities.

- Increase in the number of companies that have posted in Handshake for the first time.

Specific Action Items:
V. Alumni Engagement & Affinity

1) Employ targeted communication and marketing strategies to engage CEC alumni via editorial and video content; promote alumni stories via CEC newsletters and FIU magazine.

2) Invite successful alumni and companies with most interest in our students to serve on departmental advisory or industry boards.

3) Take advantage of FIU's Panther week and use panel series at the college to cultivate alumni relationships and provide networking opportunities.

4) Create distinguished alumni awards at the college level and nominate CEC alumni to FIU's Torch Awards.

5) Continue to invite alumni to CEC Induction to Profession ceremony as keynote speakers.

6) Engage with juniors and seniors in various platforms to highlight value of giving back; continue promoting "My More Than 2 Cents" initiative.

Measurable Metrics:
FIU Performance Indicators:

- Percentage of (CEC) alumni giving to FIU (15% by 2025).

2. Accelerate Preeminence in Research and Innovation Impact

Research is essential for attaining success, and the caliber of our graduate students exemplify FIU's research success and innovation. Focusing on research areas of critical need to the nation, brand naming and elevation in ranking are the driving forces behind this strategic plan. The overarching goal of the college is to reach prominence and recognition at the national and international levels as a college that offers engineering and computer science know-how and solution pathways to the main thrusts of this era that revolve around health, infrastructure, clean energy, and security.

As one of the strongest research colleges in the university, CEC is uniquely situated to effect South Florida's economy, and is well positioned, in terms of its research endeavors, to expand FIU's reputation and produce more impactful research on local and global landscapes with broad societal impact. With our focus placed on the aforenoted thrusts, it is the college's objective to be ranked among the top 50 public colleges by U.S. News Graduate Program rankings and for our many disciplines to be cited among the top 50 in research expenditures by NSF HERD survey. To meet these objectives, the college will continue to recruit top faculty in areas of growth, expand our research activities, consolidate research strengths through multidisciplinary and cross-disciplinary collaborations, pursue ambitious and large, center-like programs. Concurrently, faculty will be supported to recruit and retain the best qualified students through graduate studies, and to significantly increase the number of Ph.D. graduates, particularly from our own undergraduates. At the same time, we will provide our faculty and researchers the foundation and environment most suitable for them to thrive and bolster our reputation in research and innovation with targeted marketing and communication strategies.

The following strategic goals will help CEC achieve FIU's Next Horizon 2025 vision to produce meaningful, transformative research activities with high intellectual merit and broad societal impact:

- **Strategic Goal 1:** Increase research awards, expenditures, and culture of innovation with opportunities for training and professional development of our graduate students and through the promotion of the Ph.D. programs.

- **Strategic Goal 2:** Hire exceptional faculty in four identified research thrust areas with high funding prospects and retain existing productive faculty.

- **Strategic Goal 3:** Elevate our graduate programs through strategic curriculum development and through meaningful integration of research and education.

- **Strategic Goal 4:** Raise CEC's profile, visibility and recognition to reach the top 50 public colleges through proven strategies that would elevate our rankings, enhance and broaden the application domains of our main research thrusts, generate higher academic and research productivity and achievements that would yield excellent peer evaluations and assessments as means to improve our ranking.

Preeminence and advancement in research productivity and technological innovation will mainly be achieved through strategic hiring, in alignment with the FIU Next Horizon 2025 Strategic Plan and the CEC 2025 Strategic Planning. Following four main thrust areas will define our domains of exploration and investigation that would require consolidating all our efforts and current research strengths for new research findings and technological developments that would place our college in a leadership position. These four thrusts are as follows:

- **Infrastructure and resilience,** including but not limited to transportation, ergonomic construction, robotics, sensors and sensing, novel materials, smart cities, sea level rise and extreme events, and cyber-physical systems.

- **Information technologies and security,** including but not limited to artificial intelligence and machine learning, automation, internet of things (IOT), data science, forensics, cybersecurity, automation/robotics, human-machine interactions, nanoelectronics, and the wireless revolution.

- **Health,** including but not limited to imaging, brain research, bioinformatics, biosciences and biodevices, biomaterials, robotics, and machine learning for classification, prediction and for computer-aided diagnosis and prognosis.

- **Clean energy,** including but not limited to renewable energy (solar, wind, hydro), electronic materials, bio energy, fuel cells, electric cars.

Specific Action Items:
I. Faculty Hiring & Retention

1) Ensure that the hiring of faculty at the College of Engineering and Computing is strategic, with a focus placed on the intellectual merit and contributions that can be made to the previously mentioned four research thrusts of health, infrastructure, security and clean energy as well as to the research areas embedded within our FIU's preeminent and emerging preeminent programs.

2) Facilitate chairs and directors to actively search for and engage in bringing new faculty candidates with significant work experience at notable funding agencies or government research labs, such as NSF, DOT, DOD, NIH, MITRE or MIT-LL in FIU-designated preeminent or emerging preeminent programs, and within the research spectrum of the identified focus areas.

3) Work with search committees, HR, Academic Affairs to attract and retain female and underrepresented faculty.

4) Promote joint and courtesy appointments across departments within the college and university, including Applied Research Center (ARC) and the university's IT units.

5) Support and recognize highly active, including junior and mid-career faculty with funding success (e.g., submission and success in a number of proposals per year) and high scholarly activities and pursuits (e.g., certain number of papers in highly ranked journals or impactful work per year) to include awards and Fellow titles.
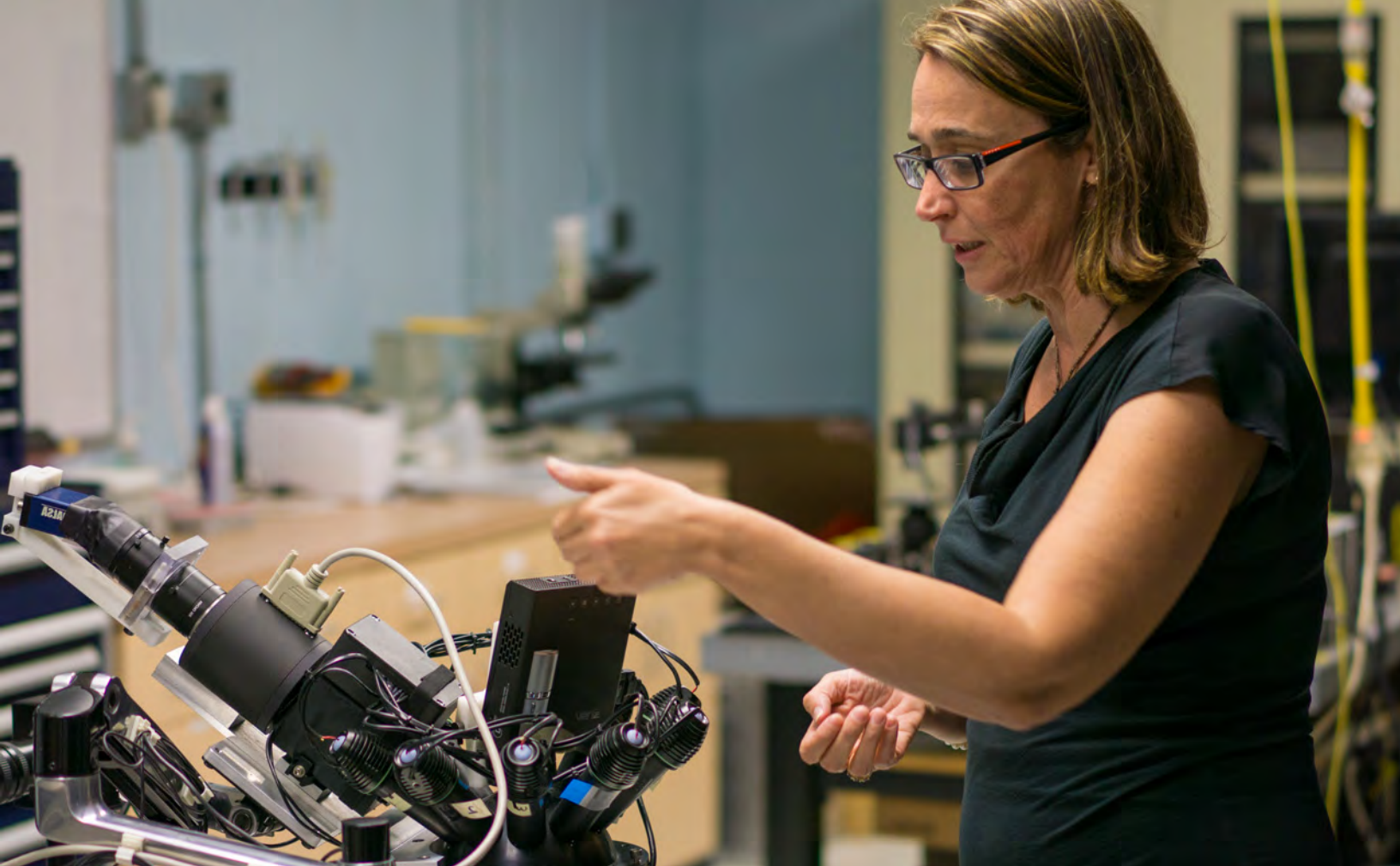
6) Assist in identifying, developing and writing major multidisciplinary proposals that are competitive and of high quality through dedicated technical staff, and preliminary reviews from experts in the field.

7) Unify and consolidate the tenure and promotion process to better address the institutional metrics as defined in the FIU Next Horizon 2025 Strategic Plan and the CEC 2025 Strategic Planning.

8) Promote, facilitate and incentivize tenured faculty to assume leadership roles in multidisciplinary research and to mentor and include junior faculty in the process.

9) Develop and implement a diversity driven Distinguished Postdoc program for transitioning highly qualified postdocs into tenured-track faculty, with a focus on attracting female faculty and other underrepresented minority groups.

10) Provide transparent, collegial, and healthy working conditions for administrators, staff, faculty and students; work with HR, Academic Affairs, Office to Advance Women, Equity & Diversity (AWED) and Division of Diversity Equity Inclusion (DEI) to develop continuous educational lectures on collegiality, healthy working environment, diversity and equity.

11) Engage Human Resources, Academic Affairs in retaining faculty members and develop alternative solutions and processes for ascertaining competitive and commensurate salaries.

Measurable Metrics:
College and Unit-Specific Outcomes:

•   Number of faculty hires in the four research thrust areas identified earlier and in relation to research activities within our preeminent and emerging preeminent programs.

•   Number of female and underrepresented faculty hires.

•   Research growth.

•   Level of attained retention and recognition given to successful junior faculty.

•   Level of leadership, mentorship and inclusion of junior faculty assumed in writing large multidisciplinary proposals.

•   Number of Postdocs transitioned into faculty, including number of female or underrepresented minorities.

•   Number of resolutions accomplished between CEC and HR.

•   Salary and compensation given to productive faculty and staff that is commensurate with competitive institutions.

Specific Action Items:
II. Research Productivity

1) Support preeminent and emerging preeminent programs, and the previously mentioned four research thrusts through increased collaborations in research proposals and joint faculty appointments.

2) Promote four research thrusts areas for endowment and philanthropic contributions.

3) Provide newly hired faculty with workshops and educational resources with support for funding applications, tips, roles of the administration, boiler-plate material, copies of successful grants.

4) Promote, incentivize, and facilitate faculty to pursue multidisciplinary proposals within the college and across the university, in preparation for highly competitive and large dollar proposals with teaming across the nation, such as NSF Engineering Research Centers (ERCs), Science and Technology Centers (STCs), Multidisciplinary University Research Initiatives (MURIs), and Industry-University Cooperative Research Centers (IUCRCs).

5) Facilitate and develop closer collaborations among entities within and outside of CEC faculty by identifying key research collaboration areas, partnering with college-wide seminars, workshop series, increasing joint or adjunct faculty appointments among departments and schools, and the sharing of resources.

6) Work closely with college advancement, corporate relations and industry relations teams to promote and establish strong relationships between their units and local industry by involving, inviting key people from industry to department and college level boards.

7) Recognize and value interdisciplinary research, invention, including budget for PhD students and postdoctoral researchers in proposals for tenure and promotion.

8) Partner with the leadership of the different units to support large proposal teaming, writing of competitive proposals, and to pursue upcoming research opportunities. This will include:

   (a) Promote incentives to senior faculty to volunteer (as a service) to monitor and communicate research and funding opportunities to junior and mid-career faculty.
   (b) Develop programs to assist new faculty in writing competitive NSF CAREER grants and Office of Naval Research (ONR), Air Force Office of Scientific Research (AFOSR), Army Research Office Young Investigator Award (ARO YIP) type proposals.
   (c) Invite and/or employ consultants, (e.g., high-level retired NSF program managers) to assist, inform and support new faculty on research opportunities and strategies for writing competitive grants.
   (d) Enhance existing relationships with funding agencies by holding college-wide workshops with federal agencies, such as ARO, NSF, DoD, NIH, DOT, and develop relationships for larger team proposals.
   (e) Establish an internal proposal review process for junior faculty to provide input and meaningful reviews before submission.

9) Pursue Small Business Innovation Research (SBIR) programs.

10) Develop organized and coherent relations, using Memorandum of Understanding (MoU) with local agencies in the four thrust research areas.

11) Encourage working conditions where success by faculty, staff, students is awarded and recognized in a timely and commensurate fashion.

Measurable Metrics:

FIU Performance Indicators:

- Increase in research expenditures ($45M by 2025)
- Increase in disciplines ranked in top 100/50 by research expenditures (5/3 by 2025)
- Continue trajectory of awarded patents per year (maintain +40)
- Increase in CEC AUTM Start-Up and licensing agreements.

College and Unit-Specific Outcomes:

- Level of support extended to existing preeminent and emerging preeminent programs and the four research thrusts.
- Endowment and philanthropic contributions.
- Research accomplishments of newly hired faculty.
- Submission and funding of number of large multidisciplinary proposals, such as ERC, STC, MURI or other Center-type proposals.
- Number of Early Career and PECASE (Presidential Early Career Award for Scientists and Engineers) awards.
- Number of Ph.D. students supported through grants.
- Number of doctoral degrees conferred.
- Number of joint appointments, joint proposals and joint publications resulting from established collaborations.
- Adoption of tenure and promotion guidelines that support CEC strategic plan.
- Growth in pre- and post-success rates of funded grants.
- Industry funding growth and contributions made due to newly developed collaborations.
- Number of new CEC advisory board members.
- Number of MOUs signed with local agencies and industries for developing joint activities.
- Research awards received from IUCRC and SBIR programs.
- Awards and budgetary incentives provided to productive faculty members.

Specific Action Items:

III. Graduate Program Growth & Student Pipeline

1) Actively recruit and hire our own undergraduate students to pursue graduate degrees at CEC and involve them early in research through such programs as the Research Experience for Undergraduates (NSF-REU) and Opportunities for Undergraduate Research and Scholarship (OURS) program housed in CD-SSEC.

2) Identify bottlenecks and barriers for timely graduation of students and create strategies to improve time to graduation.

3) Promote NSF, NIH, DoD, or other prominent graduate program fellowships to students and incentivize faculty to mentor students in writing successful fellowship applications. Support students with seminars about writing successful applications.
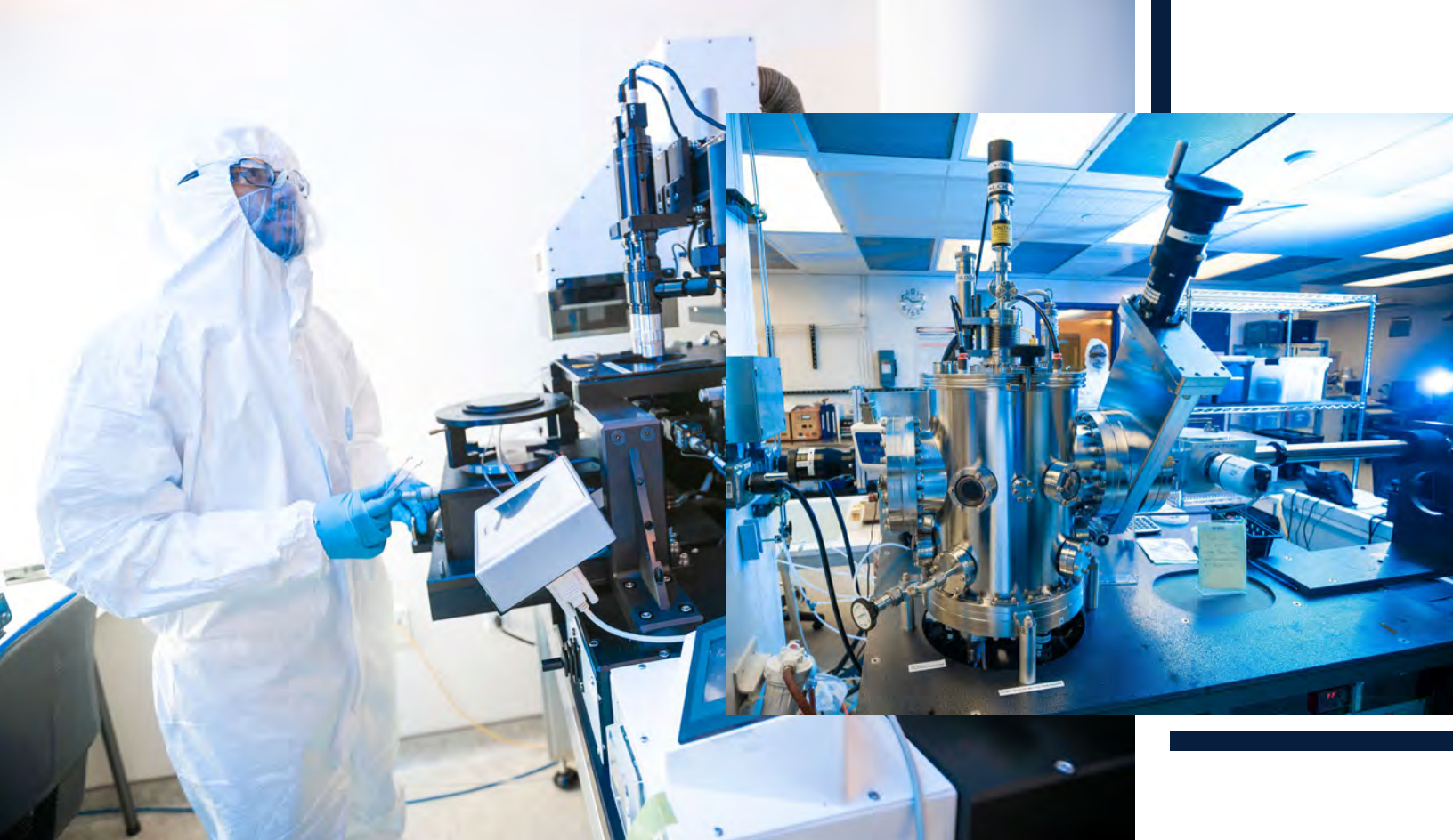
4) Encourage and monitor budgeting Ph.D. student support in proposals, and apply for REU supplements, where applicable.

5) Create annual seminars or panel series of leaders and FIU graduates working at national labs, industry and academia to increase networking and recruiting activities for our students.

6) Offer new market rate or self-supporting degrees and STEM programs targeting jobs and credentials of high demand.

7) Explore implementation of master's degree and dual-enrollment programs targeting Latin America and possibilities of delivering such programs in Spanish or Portuguese.

8) Invite adept high school students to participate in summer internship and be placed in active research labs, in the college.

9) Establish an annual, college-wide research poster day to promote recruiting of FIU's best undergrads to the Ph.D. program.

Measurable Metrics:
FIU Performance Indicators:
- Total doctoral degrees awarded per year (70 by 2025)

College and Unit-Specific Outcomes:
- Number of undergraduates engaged in research and other programs such as NSF-REU and CDSSEC-OURS programs.

- Improvement in graduation rates and good assessment practices.

- Growth of fellowships through NSF Graduate Research Fellowships Programs (GRFP), DOD- National Defense Science and Engineering Graduate (NDSEG) Programs, DOE- Science Graduate Student Research (SCGSR) Programs and Department

of Education Graduate Assistance in Areas of National Need (GAANN) Programs.

- Number of Ph.D. student advised per tenure, tenure-track faculty.

- Seminars conducted for networking with industry, national labs and federal agencies.

- Market rate or self-supporting degrees initiated in support of high industry demand and high research prospects in STEM disciplines.

- New degree programs initiated in collaboration with Latin American countries.

Specific Action Items:
IV. Rankings & Visibility

1) Develop strategies for specific reputation surveys, research productivity and influence, national and international outreach, and knowledge transfer to impact **QS World University Rankings**, **Times Higher Education World University Rankings**, and **U.S. News & World Report Rankings**, and other pertinent rankings.

2) Identify and invest in departments, units with higher chances of reaching top 50 public ranking.

3) Encourage and facilitate annual publications for schools, including programs within the schools. Coordinate these activities with college and university marketing and outreach teams. Encourage departments to publish and distribute, annually, a magazine highlighting their achievements and distribute to influencers for ranking impact.
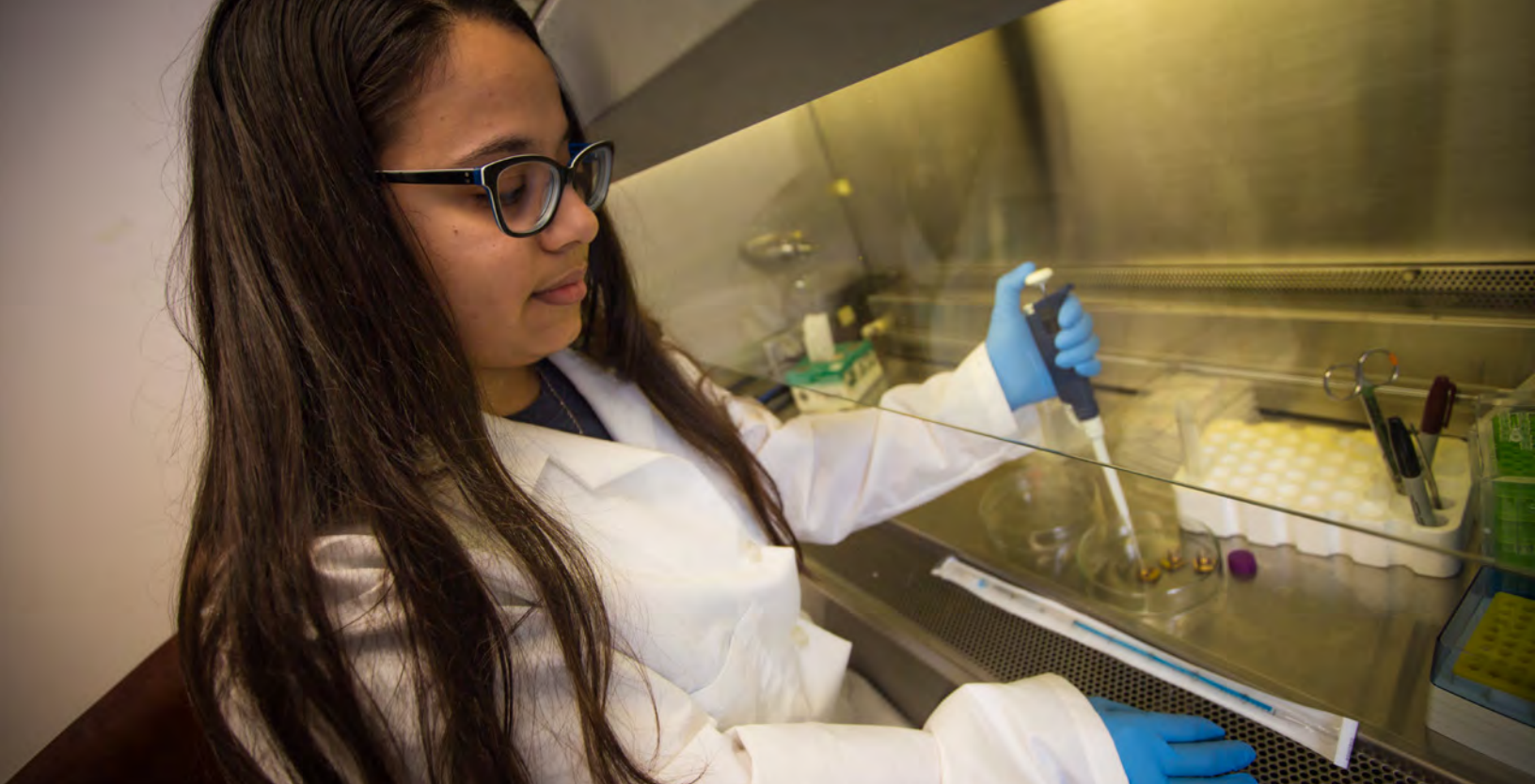
4) Provide and ensure faculty and student presenters will employ high quality CEC presentation templates for branding and name recognition at major national and international forums.

5) Promote FIU and CEC-branded products (i.e., pins or polos) to be worn by faculty and student presenters to showcase FIU's brand name.

6) Establish departmental distinguished seminar speaker series; invite deans, department chairs.

7) Continue to expand our community outreach efforts through Women of CEC and K-12 STEM programs and engage with our partners to augment our reputation in research and discovery.

8) Promote news stories regarding important accomplishments, funding at local and national media.

9) Assist directors and chairs to showcase FIU and give seminars at other institutions, in person or virtually.

Measurable Metrics:

FIU Performance Indicators:

- Number of engineering and computing programs ranked at top 50 public (8 by 2025 including THE, QS, US News)

College and Unit-Specific Outcomes:

- Evaluation scores from reputation surveys on teaching and research.
- Research productivity and influence as gauged from funded grants, publications in highly ranked journals and citations.

- Placement of CEC graduates with a bachelor's degree in high paying jobs with industry within a year from their graduation.
- National and international reach as gauged from impactful joint publications and large funded multidisciplinary and multi-institutional grants such as STCs, ERCs, MURIs and others.
- National and international collaborations.
- Proposals of consortium-like Centers awarded to the college, such as ERCs, MURIs, STCs and other DoD programs.
- Number of Early Career and PECASE awards received.
- Number of Ph.D. students advised per tenure, tenure-track faculty.
- Number of Ph.D. students supported through research grants and contracts.
- Number of enrolled Ph.D. students.
- Number of courtesy or joint faculty appointments within the college, including ARC employees.
- Number of minority and female faculty appointments.
- Number of collaborative proposals submitted and awarded, including large ($1M plus) awards.
- Reduced time to graduation for Ph.D. students from six-plus years to at most five years by 2025.
- Increased perception scores in U.S. News and World Report graduate rankings, a necessary factor to achieve top 50 public ranking.

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1 https://hr.fiu.edu/employees-affiliates/appreciation-recognition/
2 Fall 2020 professional staff headcount: research admin team (6), HR (5), fiscal administration (6), graduate program support (4)
3 Fall 2020 advising team headcount: 16.
4 Fall 2020 marketing team headcount: 2.
5 Total faculty national and international awards & honors count as of December 2018: 87 (Source: Academics Analytics)

3. Assure Responsible Stewardship

The most important asset for our university and college is our people. As of FY2020, employee attrition rate at CEC is 6.31%. Attrition is driven by several reasons, but to some extent it is associated with career growth expectations, lower salary as compared to other institutions, and possibly lack of flexibility in work schedules. We intend to aggressively tackle these issues by using surveys and producing meaningful data that lead to a culture of appreciation and recognition. We will maximize efficiency in operations through training, awareness and by applying technology effectively.

We shall strive to be good stewards of our resources: human, economic, and environmental. It's our collective responsibility to make investments in support of achieving FIU's and CEC's vision.

- **Strategic Goal 1:** Establish a flexible workforce structure in support of efficiency, productivity, and retention and, when possible, allow employees to work remotely via telework agreements to address office space and energy footprint requirements.

- **Strategic Goal 2:** Optimize operations and sustainable performance.

- **Strategic Goal 3:** Objective utilization of research space to meet institutional expectations and advance research, economic development, and scholarly activity.

- **Strategic Goal 4:** Expand CEC's professional staff support capacity in core functions (research, student services, HR and fiscal management), and strategic areas (marketing, fundraising) to accommodate and support projected growth in faculty hires, research funding and student enrollment.

Specific Action Items:
I. Employee Retention & Recognition

1) Develop a remote work policy at the college, such as "one day a week" or "one week a month", and related utilization parameters. Identify staff whose role and effectiveness are not diminished by working remotely on a part-time basis.

2) Implement a voluntary rotational program among professional staff to encourage their curious mindset and develop skills to complement their programs.

3) Revamp current CEC faculty and staff awards nomination and communication process and increase peer nomination.

4) Broaden use of university-wide recognition tools[1] to recognize significant contributions of our employees and educate CEC community on available resources that can be utilized to recognize service excellence.

5) Recognize employee personal life events through college-wide communications to help create and strengthen a sense of community.

6) Hire additional personnel to support teams involved in college-wide research administration, human resources, fiscal administration, graduate program support, marketing, and fundraising.

Measurable Metrics:
College and Unit-Specific Outcomes

- Increase in the percentage of CEC employee recognitions through FIU service recognition initiatives from 7% to 15% by 2025.

- Reduction in attrition percentage from 6% to 3% by 2025.

- Increase in professional and administrative staff involved in and supporting college core functions: research enterprise administration, human resources, fiscal administration and graduate program administration (from 21 to 26)[2].

- Growth of undergraduate advising group by 25% to meet enrollment targets and ensure quality of services (from 16 to 20)[3].

- 50% increase in the marketing and external communications group to support marketing efforts, editorial pieces and news releases throughout the college[4].

- Employee and supervisor adherence to payroll processing to limit non-compliant occurrences.

- On average, 10% of employees to use telework or flexible time work agreements.

- 15% increase in the total number of national, international awards received by CEC faculty (from 87 to 100)[5].

Specific Action Items:
II. Productivity, Sustainability and Efficiency

1) Be compliant with university policies by implementing communication and education campaigns.

2) Create college-wide payroll guidelines and protocols for managers highlighting steps, exceptions, proxy guidelines, and procedures for noncompliant cases.

3) Conduct regular meetings with unit heads about fiscal resource availability.

4) Ensure professional staff embedded within CEC units that oversee fiscal responsibilities to have appropriate training.

Measurable Metrics:
College and Unit-Specific Outcomes

- Decline in the time spent in entering avoidable transfers, collecting missing information or documents in expense reports.

Specific Action Items:
III. Research Space Optimization

1) Establish a 4-5 member CEC Research Space Advisory Committee to evaluate research space utilization, on an annual basis, and make recommendations to college administration, using ORED's Research Space Guidelines.

Measurable Metrics:
College and Unit-Specific Outcomes

- Eliminate excess research space by 2025.

Marketing our Mission and Vision

CEC's dedicated marketing and communications team serves to protect, advance, and enrich the college's overall reputation, while showcasing the quality and value of an FIU education.

In support of CEC's 2025 Strategic Plan, the college's marketing and communications team is committed to developing and executing impactful marketing strategies, media campaigns and other well-aligned communications activities aimed at increasing enrollment, the college's student retention rate, overall engagement and on-time graduation percentages, while optimizing the college's mission to developing a highly skilled engineering workforce for South Florida, our nation and the global community.

With the support of FIU's External Relations and Strategic Communications team of integrated marketing and communications professionals, media relations experts, content creators, designers, videographers and social media strategists, the college's dedicated marketing and communication unit strives to enhance FIU's brand presence before key internal and external audiences in support of the college's national rankings. It is dedicated to promoting its impactful innovations, growth, transformative research, stellar faculty and student successes.

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