Capability Statement

Institution: **University of Central Florida**

DUNS No: **150805653** Cage Code: **9H673** NAICS ID(s): **611310** SIC: **8221**
Federal EIN No: **59-292-4021**
Certificates, Registrations, Accreditations: ***SACSCOC, CSWE, CACREP, NCATE***

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OVERVIEW

Founded in 1963, the University of Central Florida is known for quality, access, impact, and value. U.S. News & World Report ranks UCF among the nation's topmost innovative colleges, a "Top Performer for Social Mobility," and a "Best Value School." As an emerging preeminent research university, we believe innovation comes from the meeting of diverse viewpoints. At UCF, minoritized students represent 49.1 percent of our student body, with Latino students representing over half of that block at 27.8 percent of the total student population. UCF is one of 24 institutions nationwide certified with the Seal of Excelencia for serving Latino students with intentionality through strong alignment in data, practice, and leadership. UCF is one of 18 Hispanic Serving Institutions (HSIs) in the country that are also Carnegie Classified as "Very High Research Activity" or Research 1 and is a member of the Alliance of Hispanic Serving Research Universities. UCF is a member of the MSI STEM Research & Development Consortium, a cooperative agreement (W911SR-14-2-0001) with the U.S. Army's Combat Capability Development Commend. Research authorization areas include basic (6.1) and applied (6.2) research as well as advanced technology development (6.3). UCF joined the Air Force Research Laboratory (AFRL) Minority Leaders Research Collaboration Program (ML-RCP). The ML-RCP enables collaborative research partnerships between AFRL and Academia that engage a diverse pool of talent in addressing foundational research challenges in support of the nation's air, space, and cyberspace technology needs. The objective of the program is to enable and enhance the research capabilities of the HBCUs/MSIs through collaborative research efforts at AFRL.

RESEARCH CAPABILITIES

- ***Aerospace and Mechanical Engineering:*** Aerodynamics, Control and Dynamics, Propulsion, Structures and Materials, Systems Design and Optimization, Thermofluids, Materials, Manufacturing
- ***Physics:*** Planetary Sciences, Atomic Molecular and Optical Physics, Soft Condensed Matter and Biological Physics, Quantum Information Sci., Mathematical Physics, Condensed Matter Physics, Computational Physics
- ***Electrical and Computer Engineering:*** Robotics, autonomous vehicles, sensors, adaptive signal processing, satellite system engineering, cybersecurity, Internet of Things, high performance computing, FPGAs
- ***Modeling and Simulation:*** Virtual Environments, Computer Generated Forces, Training & Education, Team Training and Human Factors, Complex Adaptive Systems, Autonomous Wireless Robots, Human-Robot Interface, Embedded Simulation and Training, Parallel Computing, Operational Neurosensing
- ***Civil, Environmental, and Construction Engineering:*** Advanced Transportation Systems, Traffic Safety, Management and Simulation, Stormwater Management, Hydroscience, Environmental Systems Engineering, Geotechnical Engineering, Civil Infrastructure Technologies for Resilience and Safety

- ***Optics and Photonics:*** Laser Science & Technology, Fiber Optics, Nonlinear & Quantum Optics, Integrated & Nano Photonics, Imaging & Display, Biophotonics

FACILITIES

- ***Applied Programming Languages, Software Engineering, and Education (APPLeSEEd) Lab*** - Tackles problems in software, security, and systems and cultivates computational thinking
- ***Computational Biology and Bioinformatics Lab -*** Computational biology, bioinformatics, and algorithms
- ***Computational Imaging Lab*** - Bridging the three areas of Image/Video Processing, Computer Vision, and Machine Learning
- ***Advanced Materials Processing and Analysis Center (AMPAC)*** - Heat Transfer Issues in Electro-Optics, Computing and Power Systems, and Aircraft and Spacecraft, Micro-fabrication of ceramics for MEMS applications, Polymer-derived ceramics, Nano-materials/composites: synthesis and properties, Mechanical behavior of materials: fracture, toughening, creep, wear and fatigue, Thin Film Processing, Magnetic Materials, Biological Interfaces, Nano-scale Science and Engineering, Molecular Self-Assembly, Thin Film Solar Cells, Materials Characterization and Electron Microscopy; Computational Materials Science and Microstructural Modeling; Nanomaterials processing and characterization; Materials for optics, sensors, coatings, fuel cells; Oxidation & Corrosion; Surface Science and Engineering; High Temperature Materials and Coatings including Thermal Barrier Coatings; Materials and Coatings for Energy Production, Storage and Conversion; Materials for Nuclear Fuels and Cladding; Kinetic Energy Materials; Superlight-Weight Alloys for Armor and Automotive Applications

PAST PERFORMANCE

- National Aeronautics and Space Administration, which includes awards such as the Minority University Research and Education Project (MUREP) Space Technology Artemis Research (M-STAR) and Breakthrough, Innovative and Game-changing (BIG) Idea Challenge – Lunar Dust Mitigating Electrostatic micro-Textured Overlay (LETO).
- National Security Agency and U.S. Department of Homeland Security, which includes the creation of a National Center of Academic Excellence in Cyber Defense Education.
- The Department of Defense, funding includes the development of sensors to detect nerve agents and explosives, and screening of the toxicity of organophosphate compounds.
- Foundation For Food and Agriculture Research, uncovering the genetic architecture of inducible chemical defenses in crop and wild sunflower for the sustainable control of pests and pathogens.
- The Environmental Protection Agency & U.S. Department of Agriculture, funding on water usage, agriculture and land use, field experiments in nutrient management and water quality protection.
- National Science Foundation, which includes the development of a scalable educational ecosystem for building STEM capacity at HSIs, and participation in the Computing Alliance of Hispanic Serving Institutions (CAHSI) whose purpose is to advance a research-based framework for attracting, preparing, and supporting Hispanic and female students in their trajectory toward completion of graduate degrees in computing areas.
- HSI Battle of the Brains, an academic competition that showcases Hispanic/Latinx student talent in developing solutions to social, business, and technical problems.
- Federal Highway Administration, which includes funding for several intelligent transportation system technologies across Central Florida aimed at enhancing pedestrian safety and easing congestion.
- Andrew W. Mellon Foundation, a comparative and collaborative Latino Humanities Studies research and training program.
- Bill and Melinda Gates Foundation, an effort to increase data-based research capacity among institutions of higher education that serve a large share of Black and Latino students (HBCUs/HSIs).