SUCCEED – School of Universal Computing, Construction, and Engineering Education

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SUCCEED was formed in 2018, through a collaboration between the College of Engineering and Computing and the STEM Transformation Institute, as the first engineering and computing education department at a minority-serving institution. The school was created in alignment with the university's vision to be a "leading urban public research university focused on student learning, innovation, and collaboration." As such, SUCCEED aims to be the premier department in the U.S. with expertise in developing engineering and computing leaders who reflect the growing diversity of the 21st century.

Faculty within the school, along with students and staff, seek to connect research and innovation with student learning through collaboration with other members of the college and FIU as a whole. In particular, SUCCEED faculty research and promote evidence-based approaches that broaden participation and improve educational outcomes. Through these efforts, the faculty impact current and future engineering and computer science students at FIU and beyond.

Doctor of Philosophy in Engineering and Computing Education

Admission Requirements
For admission into the program, students will:
1. Have a bachelor degree in Engineering or Computing or a closely related field.
2. Have an upper division GPA of at least 3.0 in the bachelor's degree, measured by the last 60 credits attempted.
3. Complete a Graduate Record Exam (GRE) within the prior five years.
4. Have three letters of recommendation, a copy of the transcript, and a copy of the university graduate application to the Graduate Program Director in accordance with University Graduate School deadlines.
5. Have received approval of the departmental graduate committee.
6. Foreign students whose native language is not English must obtain a score of 80 or higher on the TOEFL iBT (this corresponds to 550 on the old TOEFL test) or 6.3 overall on the 1ELTS. The University Graduate

School has a list of countries that are exempt from this requirement.

Graduation Requirements

The graduation requirements for the program will be:
1. Completing a total of 75 credit hours of coursework beyond the bachelor degree (see section VIII. C. for detail), with a cumulative GPA of 3.0 or higher.
2. Successful completion of the Comprehensive Exam. This examination is designed primarily to make sure the student has suitable background knowledge to conduct research in their chosen area. The student must pass the Comprehensive Exam by the end of the seventh semester (excluding summers) in the program if they were admitted without a Master's degree or by the end of the fifth semester if admitted with a Master's or the equivalent 15 credit hours. Two attempts are permitted. Any exception needs to be approved by the Graduate Committee.
3. Upon completion of the required core courses and passing the Comprehensive Exam, the student advances to Candidacy.
4. Choosing advisor(s). The student will choose a faculty from the College of Engineering and Computing as their dissertation advisor. A co-advisor could be selected from within the College or from outside.
5. Assembling a Dissertation Committee. The student will assemble a Dissertation Committee of at least four faculty members [including advisor(s)]. Three of whom will be from SUCCEED or the STEM Transformation Institute, and one must be from outside of SUCCEED, but within FIU.
6. Successful presentation and submission of a dissertation proposal. The student will present and defend their plan for dissertation study. The purpose of the proposal is to verify that the candidate has chosen a suitable topic for dissertation research and to evaluate the candidate's ability to conduct such research. The proposal will be submitted to at least three members of the candidate's dissertation committee (at least two of whom will be from SUCCEED or the STEM Transformation Institute). The candidate presents their accomplishments and proposed research and answer questions from the committee and others in the audience.
7. Satisfaction of the teaching requirement. The ability to teach at the university level is an important skill that should be encouraged in all graduate students. For this reason, students will be required to take the "Foundations of Engineering and Computing Teaching and Learning" course prior to candidacy, and participate in a mentored teaching practicum for one semester during their PhD studies in order to gain exposure to the classroom or laboratory teaching environment. Students with teaching experience from previous graduate programs may petition to waive the teaching requirement, in which case the three-credit course should be replaced with an alternate course. Waivers will be granted at the discretion of the Graduate Program Director.
8. Submission and defense of a dissertation based upon original research in Engineering or Computing Education. A dissertation is required of all candidates for the PhD degree and must conform to the format

outlined in the Regulations for Thesis and Dissertation Preparation Manual available to students online from the FIU Graduate School.

9. After submission of the dissertation and completion of all other required work for the PhD degree, the candidate will be given a final oral thesis defense examination by the Dissertation Committee. Successful completion of all of these steps will culminate in the granting of the PhD degree.

Engineering and Computing Education Foundations (12 credits)

Students must complete the following courses:

EGN 6008	Fundamentals of Engineering and Computing Education	3
EGN 6900	Methods and Practices in Engineering and Computing Education Research	3
EGS 6057	Equity in STEM Education: Research, Policy and Practice	3
EGN 6942	Mentored Teaching Practicum in Engineering and Computing Education	1
EGN 6957	Professional Development in Engineering and Computing Education Research	2

Required Engineering Pedagogy (3 credits)
EGS 6055   Foundations of Engineering and Computing Teaching and Learning

Research Methods/Statistics Electives (9 credits)
Students are required to completed three research methods courses. EDF 6481 is required for all students. In conjunction with their advisor, students must choose two additional research methods courses.
EDF 6481   Education Research Methods
2 Research methods electives

Specialization Courses (9 credits)
In conjunction with their advisor, students must complete nine credit hours of courses that focus on an area of specialization.

Seminar (0 credits)
Students are required to register for a seminar course and attend weekly seminars hosted by the STEM Transformation Institute.
EGN-6935 Seminar on STEM Education Research

Discipline-Specific Specialization (15 credits)
Students must complete any five courses from one of the specialization tracks listed below. The list of courses is maintained by the unit that houses the track. This requirement can be satisfied by an appropriate Master's degree from an accredited university.

Biomedical Engineering
Civil Engineering
Computer Engineering
Computer Science
Electrical Engineering
Engineering Management
Environmental Engineering
Information Technology
Mechanical and Materials Engineering

Total Credits: 75 hours

*Students without a masters degree can take comprehensive exam during summer of 3rd year

Course Descriptions
Definition of Prefixes
EGN - Engineering General; EGS-Engineering Support;

EGN 6900 Methods and Practices in Engineering and Computing Education Research (3). Foundational course in research methods and practices of engineering and computing education researchers, focusing on research design decisions, research quality, ethical implications, and publishing. Prerequisite: EDF 6481 or permission of instructor.

EGN 6907 Independent Study (1-10). A variable credit independent study course for PhD students to work on topics where standard courses cannot be offered. Topics must be related to engineering or computing education. The outcomes and goals of the course for the student must be approved by department.

EGN 6920 Cooperative Education in Engineering (1-3). A variable credit cooperative education in engineering course is for current PhD students who have a position with an organization focused on their area of study. Topics must be related to engineering or computing education.

EGN 6935: Seminar on STEM Education Research (0). Weekly interactive and engaging presentations featuring faculty, students and guest speakers sharing research topics in science, technology, engineering and mathematics (STEM) topics. Prerequisite: Graduate standing.

EGN 6939 Advanced Special Topics (1-3). An advanced special topics course for PhD students to pursue and study areas in engineering or computing education at an advanced level that are otherwise not offered. The list of topics will be announced in advance for prospective students.

EGN 6942 Mentored Teaching Practicum in Engineering and Computing Education (1). Structured application of educational theories and pedagogy through classroom teaching experiences and weekly learning community meetings. Requires students find a faculty teaching mentor. Prerequisite: EGS 6055.

EGN 6957 Professional Development in Engineering and Computing Education Research (2). An exploration of professional development tools and techniques within engineering and computing education research and practice.

EGN 7918 Graduate Research (1-25). Doctoral research prior to candidacy. Repeatable. Prerequisite: Permission of the department.

EGN 7980 Dissertation Research (1-12). Research towards completing doctorate research upon completion of their comprehensive exams. Repeatable. Prerequisite: Permission of the Major Professor and Doctoral Candidacy.

EGS 6008 Foundations of Engineering and Computing Education (3). Introductory course providing a conceptual understanding of engineering and computing education through philosophical theories for research and practice. Theory-based methods will guide students through a

historical context of engineering and computing education and its impact on current and future aspects of the fields.

EGS 6055 Foundations of Engineering and Computing Teaching and Learning (3). Introduction to learning theory and inclusive, learner-centered, and evidence-based pedagogy and assessment in engineering and computing, using a human-centered design approach to educational design.

EGS 6057 Equity in STEM Education: Research, Policy, and Practice (3). An analysis of diversity and inclusion through research, policy and practice within science, technology, engineering and mathematics (STEM) education for the private and public sectors.