FAU
FLORIDA ATLANTIC UNIVERSITY

NEW/CHANGE PROGRAM REQUEST
Graduate Programs

Department Computer and Electrical Eng. and Computer Science

College Engineering and Computer Science

UGPC Approval _____

UFS Approval _____

Banner Posted _____

Catalog _____

Program Name		Effective Date
MS in Comp. Sci., Comp. Eng., Electrical Eng., Bioengineering PhD in Comp. Sci., Comp. Eng., Electrical Eng.	☐ New Program ☑ Change Program	**(TERM & YEAR)** Fall 2019

Please explain the requested change(s) and offer rationale below or on an attachment

This proposal updates the GRE requirements for the MS and PhD programs in the department:
- the minimum requirement value is removed from the GRE requirements in the MS and PhD programs
- PhD programs: remove the GPA requirements for waiving the GRE for students in the CEECS department. The default applies, that means the students must have a minimum MS degree GPA of 3.3 to meet the admission requirements.

Faculty Contact/Email/Phone

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Consult and list departments that may be affected by the change(s) and attach documentation

Approved by		Date
Department Chair	_Nurgun Erdol_	11/16/2018
College Curriculum Chair	_(signature)_	11/19/18
College Dean	_M Candler_	11/20/2018
UGPC Chair	_____	_____
UGC Chair	_____	_____
Graduate College Dean	_____	_____
UFS President	_____	_____
Provost	_____	_____

Email this form and attachments to UGPC@fau.edu one week before the UGPC meeting so that materials may be viewed on the UGPC website prior to the meeting.

GRADUATE COLLEGE

NOV 2 6 2018

Received

Computer & Electrical Engineering and Computer Science

Master of Science with Major in Computer Engineering

The non-thesis option for this degree requires a minimum of 33 credits. The thesis option requires a minimum of 30 credits, including 6 credits of thesis. All students must take at least one course from each of the three groups listed in **Option A.**

With approval of the advisor, substitution can sometimes be made among similar courses. See the Department of Computer & Electrical Engineering and Computer Science website for updates.

Admission Requirements

Applications for admission to the master's program are approved by the University upon the recommendation of the department. All applicants must submit with their applications the official transcripts from previous institutions attended and have official GRE scores forwarded to the University. Applications for admission are evaluated on an individual basis. As a minimum, applicants are expected to meet the following requirements. Students with non-engineering bachelor's degrees, click here for additional requirements.

1. A baccalaureate degree in Engineering or a related field. (Students who do not have a computer engineering background will be expected to take additional courses; see link above);

2. At least a 3.0 (of a 4.0 maximum) GPA in the last 60 credits attempted prior to graduation;

3. A combined score (verbal + quantitative) of at least 295 on Submission of the Graduate Record Examination (GRE) score is required. GRE scores more than five years old are normally not acceptable. The GRE requirement is waived for any student who has a baccalaureate degree from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.25 (out of a possible 4.0) in the last 60 credits attempted prior to graduation;

4. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing a master's degree. In some cases, prerequisite courses may be taken after admission to the graduate program. Equivalent FAU courses follow.

Introduction to Microprocessor Systems	CDA 3331C
Structured Computer Architecture	CDA 4102 **or**
CAD-Based Computer Design	CDA 4204
Electronics 1	EEE 3300 **or**
Introduction to VLSI	CDA 4210
Data Structures and Algorithm Analysis	COP 3530
Calculus with Analytic Geometry 1	MAC 2311
Calculus with Analytic Geometry 2	MAC 2312
Stochastic Models for Computer Science	STA 4821

Master of Science with Major in Computer Science

The non-thesis option for this degree requires a minimum of 33 credits. The thesis option requires a minimum of 30 credits, including 6 credits of thesis. All master's degree students must take at least one course from each of the three groups listed in **Option B.**

With approval of the advisor, substitution can sometimes be made among similar courses. See the Department of Computer & Electrical and Computer Science website for updates.

Admission Requirements

Applicants for admission to the master's program are approved by the University upon the recommendation of the department. All applicants must submit with their applications the official transcripts from previous institutions attended and have official GRE scores forwarded to the University. Applications for admission are evaluated on an individual basis. As a minimum, applicants are expected to meet the following requirements. Students with non-engineering bachelor's degrees, click here for additional requirements.

1. A baccalaureate degree in Computer Science or a related field (Students without a computer science background will be expected to take additional courses);

2. At least a 3.0 (of a 4.0 minimum) GPA in the last 60 credits attempted prior to graduation;

3. ~~A combined score (verbal + quantitative) of at least 295 on~~ Submission of the Graduate Record Examination (GRE) is required. GRE scores more than five years old are normally not acceptable. The GRE requirement is waived for any student who has a baccalaureate degree from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.25 (out of a possible 4.0) in the last 60 credits attempted prior to graduation; and

4. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing a master's degree. In some cases, prerequisite courses may be taken after admission to the graduate program. Equivalent FAU courses follow.

Structured Computer Architecture	CDA 4102 **or**
Introduction to Microprocessor Systems	CDA 3331C **or**
CAD-Based Computer Design	CDA 4204
Data Structures and Algorithm Analysis	COP 3530
Computer Operating Systems	COP 4610
Design and Analysis of Algorithms	COT 4400
Calculus with Analytic Geometry 1	MAC 2311
Calculus with Analytic Geometry 2	MAC 2312
Stochastic Models for Computer Science	STA 4821

DOCTORAL PROGRAMS

Doctor of Philosophy with Major in Computer Engineering or in Computer Science

The department offers a program of advanced graduate study leading to the Doctor of Philosophy degrees in Computer Engineering and in Computer Science. The graduate of this program will be able to meet the highest standards of preparation for leadership in the computer science or engineering profession, including research, teaching and leadership in high-technology industry and governmental agencies. A Ph.D. Applicant's Guide is available from the department.

Admission Requirements
Application for admission to doctoral study will be evaluated on an individual basis by the department's graduate programs committee. Usually, the following four criteria must be met:

1. The applicant ~~should have a combined score (verbal + quantitative) of at least 300 on~~ must submit the Graduate Record Examination (GRE) score and must have a GPA of at least 3.3 (out of 4.0 maximum) in previous graduate work. GRE scores more than five years old are normally not acceptable. The GRE requirement is waived for any student who has an M.S. degree ~~without thesis~~ from FAU's Department of Computer & Electrical Engineering and Computer Science ~~with a GPA of at least 3.8 and for any student who has an M.S. degree with thesis from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.7~~.

2. The applicant must have a master's degree in Engineering, Computer Science or a related discipline awarded by a recognized institution. Thesis option is preferred. This requirement may be waived under exceptional circumstances (see B.S. to Ph.D. programs earlier in the College of Engineering and Computer Science section of the catalog).

3. The applicant must provide three reference letters (at least two from academia) that address the student's research potential, motivation, relative academic achievement and personality. Forms are supplied with applications for admission.

4. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing the Ph.D. degree. In some cases, prerequisite requirements may be satisfied after admission to the Ph.D. program. In such a case, proficiency in the prerequisite courses must be shown before the student takes dissertation credits.

Prerequisite courses for Ph.D. with Major in Computer Science:

Introduction to Microprocessor Systems	CDA 3331C	3 or
Structured Computer Architecture	CDA 4102	3 or
CAD-Based Computer Design	CDA 4204	3
Data Structures and Algorithm Analysis	COP 3530	3
Computer Operating Systems	COP 4610	3
Design and Analysis of Algorithms	COT 4400	3
Calculus with Analytic Geometry 1	MAC 2311	4
Calculus with Analytic Geometry 2	MAC 2312	4
Stochastic Models for Computer Science	STA 4821	3

Prerequisite courses for Ph.D. with Major in Computer Engineering:

Introduction to Microprocessor Systems	CDA 3331C	3
Structured Computer Architecture	CDA 4102	3 or
CAD-Based Computer Design	CDA 4204	3
Electronics 1	EEE 3300	3 or
Introduction to VLSI	CDA 4210	3
Data Structures and Algorithm Analysis	COP 3530	3
Calculus with Analytic Geometry 1	MAC 2311	4
Calculus with Analytic Geometry 2	MAC 2312	4
Stochastic Models for Computer Science	STA 4821	3

Electrical Engineering

COMBINED PROGRAMS

B.S.E.E. to M.S. Degree Program

This program enables qualified FAU undergraduate EE students to obtain both their B.S.E.E. and M.S. degrees in approximately five years by allowing up to 9 credits of approved graduate coursework (5000 level or higher) to apply toward both degrees as long as the combined program totals a minimum of 150 credits:

1. The student has met the minimum 120 credits for the bachelor's degree; and

2. The student has taken a minimum of 30 credits in 5000 level or higher courses for the master's program.

This essentially takes away approximately one semester of coursework and offers an attractive option for enthusiastic students planning for their graduate education. Students who have a cumulative GPA of 3.25 or better after completing 96 credits toward the B.S.E.E. are eligible for admission to the program. Students complete the undergraduate degree first.

Prerequisite Coursework for Transfer Students
Students transferring to Florida Atlantic University must complete both lower-division requirements (including the requirements of the Intellectual Foundations Program) and requirements for the college and major. Lower-division requirements may be completed through the A.A. degree from any Florida public college, university or community college or through equivalent coursework at another regionally accredited institution. Before transferring and to ensure timely progress toward the baccalaureate degree, students must also complete the prerequisite courses for their major as outlined in the *Transition Guides.*

All courses not approved by the Florida Statewide Course Numbering System that will be used to satisfy requirements will be evaluated individually on the basis of content and will require a catalog course description and a copy of the syllabus for assessment.

Program Process
1. Eligible students apply to the department for acceptance into the program during the term in which they will complete 96 credits toward their B.S.E.E. degree.

2. Eligible students take the Graduate Record Exam (GRE, verbal and quantitative) during the term in which they will complete 96 credits toward their B.S.E.E. degree.

3. Eligible students normally apply for graduate admission after obtaining a combined score of 1000 or more on the GRE.

4. Eligible students take courses in their senior year that will apply to both their B.S.E.E. and M.S. degrees.

5. Students participating in this program may opt for the thesis or non-thesis option in their M.S. degree.

6. Students planning for the thesis option need a letter of recommendation from their potential thesis advisor.

7. Students must be admitted to the joint B.S.E.E./M.S. program at least one semester prior to the start of their M.S. degree program.

8. Students who are successful in completing their M.S. degree within one year will be presented a certificate of recognition.

Degree Requirements
Students participating in this program must satisfy the degree requirements for a B.S.E.E. and M.S. as outlined in this catalog.

MASTER'S PROGRAM

Master of Science with Major in Electrical Engineering

The department offers thesis and non-thesis options at the master's level. Students may specialize in several areas: telecommunications; digital signal processing; systems and robotics, including control systems and machine vision; electromagnetics and RF, antennas, microwave systems, EMC/EMI and HF RF circuit design; alternative energy systems, including photovoltaic and fuel cell systems; bioengineering; neural networks; and optics and photonics.

Admission Requirements
All applicants must submit GRE scores and official transcripts from all previous postsecondary institutions attended. Applicants for admission will be evaluated on an individual basis and must satisfy the following requirements. Students with non-engineering bachelor's degrees, click here for additional requirements.

1. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS).

2. A baccalaureate degree in Engineering, Natural Science or Mathematics;*

3. A minimum GPA of 3.0 (of a possible 4.0 maximum) in the last 60 credits of undergraduate work;

4. A combined score (verbal + quantitative) of at least 295 on Submission of the Graduate Record Examination (GRE) score is required. GRE scores more than five years old are normally not acceptable. The GRE requirement is waived for any student who has a baccalaureate degree from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.25 (of a possible 4.0) in the last 60 credits attempted prior to graduation.

* Students whose backgrounds are not in electrical or computer engineering should expect to take additional coursework to satisfy deficiencies.

DOCTORAL PROGRAM

Doctor of Philosophy with Major in Electrical Engineering

Admission Requirements
Applicants for admission to doctoral study will be evaluated on an individual basis by the departmental graduate admissions committee. As a rule, the applicant must have:

1. At least a 3.3 (of a possible 4.0 maximum) grade point average in the last 60 credits attempted in the relevant field;

2. A combined score (verbal + quantitative) of at least 300 on Submission of the Graduate Record Examination (GRE) score is required. GRE scores more than five years old are normally not acceptable. The GRE requirement is waived for any student who has an M.S. degree without thesis from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.8 and for any student who has an M.S. degree with thesis from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.7;

3. A master's degree in Engineering or a related discipline awarded by a recognized institution (thesis options are preferred);

4. Two reference forms that document the applicant's research potential, motivation, relative academic achievement and personality;

5. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS).

Applicants are expected to have taken the following prerequisite courses (or equivalents) before pursuing the Ph.D. degree. In some cases, prerequisite requirements may be satisfied after admission to the Ph.D. program. In such a case, proficiency in the prerequisite courses must be shown before the student takes dissertation credits.

Students must take EEL 3118L, Electronics Laboratory 1, and at least four more courses from the table.

Introduction to Microprocessor Systems	CDA 3331C
Electromagnetic Fields and Waves	EEL 3470
Electronics 2	EEE 4361
Introduction to Digital Signal Processing	EEE 4510
Communications Systems	EEL 4512
Controls Systems 1	EEL 4652
Analysis of Linear Systems	EEL 4656

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Bioengineering

Bioengineering stands at the intersection of the revolution taking place in advanced medical treatments as a result of applying the principles and practice of the engineering and computer science disciplines to the biological, biomedical and medical sciences. Bioengineering is a broad and emerging field that impacts drug delivery, surgery, diagnosis, prevention and treatment. Students successfully completing the Master of Science in Bioengineering degree program will be prepared for professional careers in businesses related to medical diagnostics, prosthetic devices and neural and other implants; the pharmaceutical and biotechnology industries; and consulting in health-related fields, as well as other positions in industry, commerce, education and government. Students will also be prepared to continue their formal education at the Ph.D. level in a variety of science and engineering disciplines and at the M.D. level in certain cases.

Master of Science with Major in Bioengineering

Admission Requirements
All applicants must submit GRE scores and official transcripts from all previous postsecondary institutions attended. Applicants for admission will be evaluated on an individual basis and must satisfy the following requirements. Students with non-engineering bachelor's degrees, click here for additional requirements.

1. International students from non-English-speaking countries must be proficient in written and spoken English as evidenced by a score of at least 500 (paper-based test) or 213 (computer-based test) or 79 (Internet-based test) on the Test of English as a Foreign Language (TOEFL) or a score of at least 6.0 on the International English Language Testing System (IELTS);

2. A baccalaureate degree in Biology, Chemistry, Physics, Computer Science or Engineering with a mathematics background through Calculus 2 or calculus with basic differential equations; *

3. A minimum GPA of 3.0 (of a possible 4.0 maximum) in Science, Mathematics and Engineering courses;

4. A combined score (verbal + quantitative) of at least 295 on Submission of the Graduate Record Examination (GRE) score or an the MCAT score of 500 or higher is required. GRE scores more than five years old normally are not acceptable. The GRE requirement is waived for any student who has a baccalaureate degree from FAU's Department of Computer & Electrical Engineering and Computer Science with a GPA of at least 3.25 (out of a possible 4.0) in the last 60 credits attempted prior to graduation.

* Students whose backgrounds are not in the disciplines noted should expect to take additional coursework.