

UNIVERSITY OF SOUTH FLORIDA

Electrical Engineering

Graduate Student Handbook

Welcome to the Department of Electrical Engineering at the University of South Florida! As the Electrical Engineering Chair and Graduate Program Director we will work diligently to ensure you receive a world-class education in your chosen area of study. Please do not hesitate to seek our assistance and guidance at any time as you progress through the program.

Your time in graduate school can be one of the most fulfilling and rewarding experiences in your educational life. You will expand your technical knowledge and interact with student colleagues and faculty that share your passion for learning. You have selected a department with a committed faculty that has high expectations for you, and instructional and research facilities that will prepare you for success as you move forward in your careers.

We are honored that you have placed your trust and confidence in us

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The mission of the Electrical Engineering Department in the College of Engineering at the University of South Florida is to provide a high quality education in electrical engineering for our students and practicing professionals; create new knowledge and solve real world problems via innovative research and disseminate this information for the benefit of society; and to engage in effective regional, national and international service and outreach.

Engineer's Creed:

As a professional Engineer, I dedicate my professional knowledge and skill to the advancement and betterment of human welfare. I pledge: To give the utmost of performance; To participate in none but honest enterprise; To live and work according to the laws of man and the highest standard of professional conduct; to place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.

Code of Ethics: Institute of Electrical and Electronics Engineers, Inc.: We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. To accept responsibility in making engineering decisions consistent with the safety health; and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. To avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. To be honest and realistic in stating claims or estimates based on available data;
4. To reject bribery in all its forms;
5. To improve the understanding of technology, its appropriate application and potential consequences;
6. To maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. To treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. To avoid injuring others, their property, reputation, or employment by false or malicious action;
10. To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

General Graduate Student Information

University Policies and Information

Graduate students are responsible for checking the links on the Graduate School websites as this information may change from time to time and does govern the policies of the College of Engineering and the Department of Electrical Engineering.

Admissions: General graduate admissions information and policies may be found at the following website: <http://www.usf.edu/admissions/graduate/>. The Electrical Engineering website is at <http://www.usf.edu/engineering/ee/index.aspx>. Please consult these websites for the latest information.

USF Graduate School: Information regarding graduate study at USF may be found at <http://www.grad.usf.edu>. The Graduate Catalog is available at this site, and includes all current University policies for Graduate Students including: admission, registration, tuition/fees, academic policies and regulations, University degree requirements and graduation information.

Financial Aid: Financial assistance is available through the Office of Financial Aid. Students requiring such assistance should contact <http://www.usf.edu/finaid> for information.

Parking Services/BullRunner: Parking and transportation information may be found at: http://usfweb2.usf.edu/parking_services/default.asp. Please note that all parking at USF requires a permit and violators will be ticketed and/or towed at the owner's expense. Permits may be purchased by logging onto OASIS. Failure to pay parking violations will result in academic holds and an inability to register for classes. You may pay parking fines in person at parking services or on their website (note: parking services does not accept cash or checks). The BullRunner is a free shuttle that runs routes across the campus. Please consult the website for current routes and schedules.

Academic Computing/E-Mail Accounts: All students registered for courses at USF are eligible for a free student email account from Academic Computing. To activate a student account, visit the University Network Access website at <https://netid.usf.edu/una/>. You will need your "U" number to activate your NetID. Your NetID allows access to a variety of services including myUSF/Canvas online courseware, open-use computing labs, free software downloads, and USF library online services. If you experience problems with the website, please contact the IT Help Desk at 813-974-1222.

Student ID Cards: For information on USF Card Services, see the website at: <http://www.usf.edu/it/class-prep/usf-card.aspx>. All USF students are required to obtain and carry a USF ID. The cost of this card is \$10 and qualifies you for graduate student privileges at the Tampa Library and at local businesses that provide student discounts.

International Students: International Student and Scholar Services (ISSS) at USF is the main administrative and advising office for approximately 1,400 international students and 200 research scholars from 130 countries. All necessary ISSS information is communicated to international students by ISSS (including a checklist). If you are an international student you should contact ISSS for important and useful information use once you arrive on campus.

Office Location and Hours:

USF Tampa Campus, Cooper Hall (4th floor), Room 469, Monday-Friday, 8:00 a.m. to 5:00 p.m. Contact at (813) 974-5102 (phone)
(813) 974-0491 (fax) and via email at internationalservices@usf.edu.

Veterans: USF is approved for the education of veterans, eligible dependents, members of the selected reserve, and active-duty personnel who are eligible for benefits under public laws in effect. All degree programs currently offered at USF are approved by the State Approving Agency. Students who may be eligible for benefits are urged to contact

Veterans Services for information, procedures, and forms as early as possible. To initiate, change, or renew benefits at USF, a request must be submitted through Veterans Services. VA regulations require that students take only courses that are applicable to their degree program or other approved program and make satisfactory progress toward their degree. Students should consult the “Handbook for VA Students” (available at the USF Veterans Services office) or log on to USF Veterans Services web site <http://www.veterans.usf.edu/index.asp> for information on various programs and services, and VA rules and regulations.

Graduate and Professional Student Council (GPSC): The GPSC represents all graduate student interests pertaining to academic issues in regular meetings with the USF President, Provost, Dean of Graduate Studies, the Graduate Council, Student Government, and other University Administrators. Advantages to joining the GPSC include:

- Staying abreast of current issues of importance to graduate students
- Receiving announcements on deadlines, scholarships, courses, etc. from USF faculty
- Receiving information on on-campus research positions and general job openings
- Receiving announcements on current GPSC socials, seminars, and meetings

To join the GPSC, visit “Organizations” in myUSF/Canvas or visit <http://www.gpsc.usf.edu/>

Department of Electrical Engineering Policies and Information

Student Registration Information

OASIS

Login and Registration: To register for classes, students must login to the Student OASIS System at <http://usfonline.admin.usf.edu>. Note: Florida law requires that all students enrolled in colleges and universities be immunized against certain communicable diseases. Students who are not properly immunized or who do not have proof of immunization or an approved exemption (medical/religious) will have a registration hold placed on their account.

Health history forms are available at <http://www.shs.usf.edu/immunization/immunization-forms.aspx>. If you have additional questions, please contact the Immunization Compliance Office at (813) 974-4056 or email: immunization@shs.usf.edu. Additional information regarding all registration requirements may be found in the Schedule of Classes. Step-by-step instructions are available at http://www.registrar.usf.edu/howtos/oasis_student_registration/.

Continuing degree-seeking students register online during the preceding term for their next semester’s courses. Dates and instructions for all registration periods are published in the Schedule of Classes for the appropriate semester. Registered students may make schedule adjustments in the regular registration period during the preceding term or during the drop/add period during the first week of classes. Degree-seeking students who do not register prior to the first day of classes may late-register the first week of classes. A late registration fee is charged during this week. To avoid cancellation of registration, fees are due and payable for all registered courses of record on the fifth day of classes (end of drop/add period).

Late Registration Fees: To avoid a late payment fee, all tuition and fees must be paid in person at the Cashier’s Office, on OASIS, or postmarked by the U.S. Post Office (not office metered), by the fifth day of the term. A student whose registration has been cancelled may request registration reinstatement through the fourth week of class for the academic term. Upon approval for reinstatement, all fees and other debts owed to the University must be paid in full by cash, money order, check, or credit card before reinstatement will be effected. Students receiving financial aid may receive a deferment of their tuition fees until their aid is disbursed. Please verify this in OASIS to avoid a late payment charge.

Graduate Petition to Add or Drop a Course Late: If a student wishes to add or drop a course after the registration deadline, s/he should obtain and complete a “Graduate Petition” and submit it through the Department’s Graduate

Director (who will submit it to the College). This form (and others) can be obtained by going to the Graduate School website (www.grad.usf.edu) and clicking "Forms".

myUSF/Canvas Features: The University web portal, <https://my.usf.edu>, is a one-stop shop of online services provided via the web for USF faculty, staff, and students. After logging into the myUSF site, you will first see the myUSF page, a customizable personal page. At myUSF/Canvas, you can: 1) view course materials and grades (when available) by clicking on the "Courses" tab in the navigation menu, 2) check and send email using Gmail, 3) browse the USF user directory, and 4) link directly to OASIS. Other portal features beyond the myUSF page include links to: Course catalogs, Library resources, Information Technology, organizations on campus, a customizable Google Apps homepage, and other university-wide resources.

Gaining Access to myUSF:

1. From a web browser, visit <https://my.usf.edu>
 2. Login with your NetID and password (if you don't have a NetID, visit <https://webauth.usf.edu/login?service=https%3A%2F%2Fnetid.usf.edu%2Funa%2F&gateway=true> and follow the instructions).
 3. Once inside myUSF, browse through courses, communities, and resources by clicking the tabs at the top of the page. You may also modify the content and the layout to best suit your needs, and create a personalized home page at My Google Apps @ USF where you can add links to your USF Gmail account,
- Important Academic Policies that Apply to All Electrical Engineering Graduate Students

Continuous Enrollment: All graduate students must maintain continuous enrollment, defined as completing 6 hours of graduate credit within 3 consecutive semesters. Students who have advanced to candidacy must be signed up for two credit hours (likely dissertation hours) each and every semester following advancement and through to the graduation semester. This policy includes summers. Students who do not maintain continuous enrollment, as defined above, may be dropped from the program and required to re-apply. More details regarding enrollment can be found in the graduate catalog: http://www.grad.usf.edu/inc/linked-files/Catalog%20and%20Policies/2011-2012/Section7_EnrollReq_2011-2012.html.

In Good Standing: Electrical Engineering Masters students must maintain a USF/Overall grade point average of 3.0 ("B") in all courses and meet the requirements of the degree program to be considered "in good standing". Doctoral students must maintain an overall grade point average of 3.25 in USF courses and meet the requirements of the degree program to be considered "in good standing". No grade below a "C-" will be accepted toward a graduate degree. All grades earned will be counted in computing the overall grade point average (GPA). Any student who is not in good standing at the end of a semester shall be placed on probation. The College or Department may also place students on probation for other reasons. Notification of probation shall be made to the student in writing by the Graduate School, with a copy to the Department and their advisor. A Graduate Assistant who is placed on probation will lose his/her assistantship.

Academic Dishonesty Policy: The field of Electrical Engineering is based upon the integrity of those people working in it. It is assumed that students in the Department of Electrical Engineering will live up to the highest levels of academic honesty. All papers, research, and examinations will be monitored carefully and students found cheating will be punished to the fullest extent allowed by the University and the Department. The Electrical Engineering Faculty has voted and approved a departmental academic integrity policy that all students are required to sign and submit to the department as follows:

Statement on Academic Integrity for All Electrical Engineering Courses

Academic Integrity

The faculty of the Electrical Engineering Department is committed to maintaining a learning environment which promotes academic integrity and the professional obligations recognized in the IEEE Code of Ethics (<http://www.ieee.org/about/corporate/governance/p7-8.html>). Accordingly, the department adheres to a common Academic Integrity Policy in all of its courses. This policy is to be applied uniformly in a fair and unbiased manner.

University rules regarding academic integrity will be strictly enforced. It is not acceptable to copy, plagiarize or otherwise make use of the work of others in completing homework, project, laboratory report, exam or other course assignments. Likewise, it is not acceptable to knowingly facilitate the copying or plagiarizing of one's own work by others in completing homework, project, laboratory report, exam or other course assignments. It is only acceptable to give or receive assistance from others when expressly permitted by the instructor. Unless specified otherwise, as in the case of all take-home exams, scholarly exchange regarding out-of-class assignments is encouraged. A more complete explanation of behaviors that violate academic integrity is provided at:

<http://ugs.usf.edu/pdf/cat1314/08ACADEMICPOL.pdf>

The minimum penalty for violation of the academic integrity policy stated in the preceding paragraph is the greater of an automatic zero on the assignment or a letter grade reduction in the overall course grade. Student(s) found in violation of the policy on an exam will receive an F or FF in the course. Violations of the policy will be recorded in a letter from the instructor that is kept in the student files held by the department. A second violation of the policy, irrespective of whether it was related to an exam or any other course assignment, will result in expulsion from the Electrical Engineering Department.

By signing below, I acknowledge that I have read and understood the above policy and acknowledge that the policy stated herein takes precedence over any related statements contained in the syllabi for Electrical Engineering Department courses:

Name: _____

Signature: _____

U Number: _____

Date: _____

EFFECTIVE January 2018

USF Department of Electrical Engineering Master of Science (MSEE)

MSEE Program Description

The MSEE is a 30 credit hour program designed to provide the student with a high quality education in electrical engineering; create new knowledge and solve real world problems via innovative research and disseminate this information for the benefit of society; and to engage in effective regional, national and international service and outreach. Students in the Electrical Engineering Department can select an area of specialization in Biomedical, Communications and Signal Processing, Control Theory, Energy-Power, Microelectronics, or Wireless and Microwave, or follow a broader course track through the MSEE with no concentration.

MSEE Program Requirements*

Thesis Option	Non-thesis Option
6 hours of EE approved Math Courses	6 hours of EE approved Math Courses
12 hours of sequence courses according to specialization area	12 hours of sequence courses according to specialization area
6 hours of EE approved elective hours	12 hours of project, elective or independent study hours
6 hours of Thesis	MSEE Portfolio
All PhD students and MSEE students who are TAs must also take the EE Graduate Seminar**	

*All Electrical Engineering Graduate students are required to take only EE courses during their first semester. Following the first semester, with advisor and departmental approval, Masters students can take up to 6 hours of course work outside the EE department.

**The Graduate Seminar course is required to be taken by all PhD students once before the Doctoral Qualifying exam and the second time prior to finishing the program. MSEE students are required to take the seminar one time only if they are Teaching Assistants for the department.

The College of Engineering offers a Master of Science in Engineering Science through the Dean's Office for students that do not have undergraduate degrees in an Engineering field. Further information can be found by contacting the [Dean's Office](#)

Further details within the areas of specialization can be found at the following links:

[Biomedical](#)

[Communications and Signal Processing](#)

[Control Theory](#)

[Energy-Power](#)

[Microelectronics](#)

[Wireless and Microwave](#)

Partial Listing of Capstone Courses for Non-thesis Students:

Biomedical Systems:

EEL 6935 Bioelectricity
EEL 6935 Bioelectronics
EEL 6514 Biomedical Image Processing

BioMEMS and Microsystems:

MEMS: Micro-Electro-Mechanical Systems
EEL 6226 Microsystems and MEMS Technology

Microelectronics:

Materials, Processes and Devices:

EEL 6935 Advanced IC Technology
EEL 6353 Semiconductor Device Theories

Systems and Design:

EEL 6936 Intro to VHDL
EEL 5357 Analog CMOS/VLSI Design
EEL 6935 System on a Chip
EEL 6936 Rapid System Prototyping

Communication and Signal Processing:

EEL 6752 Digital Signal Processing II
EEL 6586 Speech Signal Processing
EEL 6597 Wireless Network Architectures and Protocols

Energy, Power Electronics, and Controls:

EEL 6227 Electrical Machines and Drives
EEL 6936 Rapid System Prototyping

Wireless and Microwave:

EEL 6427 RF and MW Circuits II
EEL 6481C Numerical Electromagnetics
EEL 6425 RF/MW Measurement
EEL 6430 MMIC Design

Master's Program Credit Hours

For students writing a master's thesis, the minimum total number of credit hours is 30 (24 cr. hours of class work/6 hours of thesis); and for course work students the minimum is 30 credit hours of class work (including capstone course). Students must register with a specific professor for thesis and independent study hours. Each professor will have their individual Thesis and Independent Study sections.

PLEASE NOTE: The graduate program coordinator is responsible for evaluating the student's overall transcript to ensure that the following distributional requirements are met:

- (i) Minimum two semesters of designated applied Mathematics courses
- (ii) Minimum 10 cr. hours of formal regularly scheduled 6000-level course work for thesis students (13 hours for course work/comp exam and project students).
- (iii) Minimum 16 hours net of regularly scheduled classes, thesis, independent study, or directed research at 6000 level.
- (iv) At least two 6000-level courses must have a graduate course as a prerequisite (e.g.: EEL6752 Digital Signal Processing II [prereq. EEL 6502 Digital Signal Processing I]). This requirement covers all options (microelectronics, communications, controls, etc.) and whether or not a student is doing the thesis, project or course work option.
- (v) The master's thesis must account for exactly 6 of the 30 credits required for thesis students.
- (vi) All students must be registered the semester of graduation for a minimum of 2 credit hours.

Coursework Option Students: EE Students can elect to take the course work only without doing a thesis. Course work students must take 30 credit hours (ten courses). All students must maintain a minimum 3.0 GPA. Course work students must complete at least one approved "capstone" course, and the Graduate Course Portfolio

Graduate Course Portfolio

(For Non-Thesis Master's Students in the Electrical Engineering Department)]

Graduate students in the USF Electrical Engineering Department Non-Thesis Master's Program are required to compile and submit a Graduate Course Portfolio prior to graduation. This requirement does not apply to students who complete a master's thesis or to continuing PhD students¹. Students are encouraged to prepare a high quality Portfolio document that may serve them beyond the completion of their degree program as they pursue employment opportunities. The Portfolio will summarize student accomplishments in the M.S.E.E. program and can be used to supplement information that is typically contained in a resume.

The Portfolio is to be attempted the semester before the student intends to graduate, which is also when the graduation application is due. For the purposes of this document, this semester is referred to as the Portfolio Semester.

The Portfolio will be assigned with one course that the student is taking during the Portfolio Semester. This is the Portfolio Course, which will nominally be the 3 credit hour Electrical Engineering course with the lowest number that the student is taking during the Portfolio Semester. (Course numbers 5935/36 and 6935/36 are normally excluded from being Portfolio Courses.) Alternative Portfolio-course association arrangements will be made as necessary.

It is extremely important that Portfolio contain ONLY original content. A Portfolio that is found to have non-original content will receive a failing grade and the student will receive an F in the Portfolio Course. A second occurrence will result in dismissal from the program. Students are encouraged to read the section below on Non-Original Portfolio Content.

Content:

The Portfolio must address the following outcomes of the master's (non-thesis) program:

1. graduates will demonstrate an advanced level of knowledge in a primary defined area of specialization within electrical engineering.
2. graduates will demonstrate an advanced level of knowledge in a second defined area of specialization within electrical engineering.
3. graduates will demonstrate complex problem solving skills acquired by a mastery of subjects in advanced mathematics.

For each outcome, i.e. Sequence 1, 2, and graduate mathematics (2 courses each), the Portfolio should contain a 0.5-1 page essay explaining specifically how the outcome was obtained (e.g. what advanced level of knowledge in a primary defined area of specialization was demonstrated), supported by an example of the student's course or project work that supports the claim of achievement. The example of course or project work should be appended to the page containing the essay. The total length of the Portfolio should therefore be no less than 6 pages and not more than 10 pages, with the maximum length determined by the quantity of example work². Note that a 1-page example of course or project work, e.g. a problem from an exam in a mathematics course, is sufficient given that it is of appropriate quality.

Students are strongly encouraged to take courses necessary to satisfy the sequences and math requirements early in their programs. If a student has not completed the necessary courses by their Portfolio semester, he/she is still required to prepare a Portfolio that meets the length contents described above. In this case, the student should provide more content pertaining to the courses that they have completed, or are completing during the Portfolio semester.

The Portfolio will be reviewed by up to three members of the EE faculty, and evaluated according to the overall quality of the writing, the clarity of the explanation of how the outcomes were achieved, and the quality of the examples that are included.

Assessment:

Students have a maximum of two opportunities to submit a passing Portfolio. If a student is required to make a second attempt at the Portfolio requirement, it will be assigned during a semester after the first attempt was made. As the Portfolio represents the MSEE program comprehensive exam, a student who does not receive a passing grade on the second Portfolio attempt will be dismissed from the EE program. Students will not receive a third opportunity to submit a passing Portfolio.

Score of 2.75 or higher: The student passes the Portfolio requirement and his/her final grade in the Portfolio Course is not affected.

Score <2.75 on first attempt: The student's final grade in the Portfolio Course will be lowered by one full letter grade if the low score is based on low Portfolio quality. The student will receive an F in the Portfolio Course if the EE evaluation committee determines that the Portfolio contains content that is not original, i.e. content that is plagiarized from another source.

Score <2.75 on second attempt: The student will be dismissed from the MSEE program. In addition, the student's final grade in the Portfolio Course will be lowered by one full letter grade if the low score is based on low Portfolio quality. The student will receive an F in the Portfolio Course if the EE evaluation committee determines that the Portfolio contains content that is not original.

Non-Original Portfolio Content:

The department has a zero tolerance policy regarding non-original content in Portfolios. The use of non-original content is a violation of the department's academic integrity policy, and two violations of the policy result in program dismissal.

Non-original content includes material that is plagiarized from another source. Copying a single sentence, or parts of a sentence, from another source and using the material in the Portfolio is not allowed. Furthermore, if a student has used plagiarized material from another source in a report or other assignment for a different course, that does not make it acceptable to then use the material in the Portfolio and claim it as one's own work. The EE Department may use automated plagiarism checking software, web searches or other means to determine if a Portfolio includes any non-original content.

¹ A continuing PhD student is defined as one who has completed the Doctoral Qualifying Exam in the Electrical Engineering Department. An MSEE program is not considered to be completed until either a) the portfolio requirement has been satisfied, or b) a master's thesis requirement has been met, or c) the Doctoral Qualifying Exam has been passed.

² The Portfolio document is expected to have a minimum of 6 full pages of content, with approximately 600 words per page or 400 words and one figure. Portfolios which are found to have an insufficient amount of content will be downgraded appropriately during the assessment.

Thesis Student Requirements

MS thesis students are strongly advised when they BEGIN their thesis to familiarize themselves with the requirements and associated deadlines found on the Graduate School website (<http://www.grad.usf.edu/ETD-res-main.php>).

MSEE Major Professor

Students choosing the Master's Thesis option should select a faculty advisor/major research professor by the end of their 2nd semester in the program. It is important that students meet and get to know the faculty member and their research interests prior to selecting their advisor to ensure successful collaboration.

Thesis Committee: Students working toward a thesis degree will have the benefit of a three-member committee, selected by the student and their faculty advisor. It is the responsibility of the student to find a faculty member that agrees to be their thesis advisor. The committee will approve the plan for research, supervise the research, and read and approve the thesis for content and format. The student and his/her major professor will identify the two other faculty committee members jointly. The major professor must be from Electrical Engineering. If students have co-major professors, at least one must be from Electrical Engineering. Only tenure-line faculty members can serve as chair or co-chair of a thesis committee. A faculty member may not serve as a (sole) chair of a thesis committee until s/he has served as a member or co-chair of a thesis to completion. A student who nominates a person from outside the EE department to serve as a member of the committee must submit a CV for that person.

Once a proposed committee has been determined, a [Supervisory Committee Form](#) needs to be completed by the student and submitted to the committee members for signature. The student should submit the form to the Graduate Program Assistant, who, if s/he approves the committee makeup, will maintain a copy in the student's file and forward the original to the Dean's Office in the College of Engineering. The committee appointment is official only after receiving College approval. An approved and current Supervisory Committee Form must be on file in the College before graduation may be certified. Committee forms need to be processed as early in the program as possible, but no later than the semester prior to graduation.

Changes to the Supervisor Committee: [Change of Committee Forms](#) should be submitted for approval if the student wants to change the makeup of his/her committee or the status of a member (e.g., changing a member to chair). Faculty members who are removed from the Committee are not required to sign the revised form, provided that the Major Professor has signed indicating approval of the change. Any non-USF person being added to a committee must submit a CV for approval. Changes to a committee are official only once approved and filed by the Graduate School.

Oral Defense of Thesis: The student will complete the thesis with the guidance of his/her Major Professor and Committee. Upon completion of the thesis, the student will submit to an oral defense before the thesis is submitted for final approval to the Graduate School.

Defense Notification- It is the student's responsibility to schedule the Thesis Defense in a timely manner. The student must fill out the [Masters Defense Announcement](#) and email to the Graduate Program Assistant to send out notification to the department faculty of the defense at least 3 days prior to the defense. The student should also provide [assessment rubrics](#) for the committee to fill out upon completion of the oral defense to be submitted to the graduate program assistant.

The Thesis Committee administers the oral examination. Any faculty member in the department may attend and examine if desired, but the right of voting is reserved to members of the thesis committee. The thesis and oral defense will be evaluated as a combined effort. There are three possible outcomes: Pass, Pass provided specific modifications

are made, or Fail. If the outcome is a failure, the oral defense must be repeated within one semester of the first attempt. It is the responsibility of the chair of the Thesis Committee to notify the Graduate Director in writing of the action taken by the Thesis Committee. Students who are passed conditionally upon modifications to the thesis will have such time to complete them as the committee determines appropriate. The modified thesis will be resubmitted to the Committee for final approval. After this step is completed the student may then submit the thesis to the Graduate School.

Graduate School Format Requirements: The University uses the “Electronic Thesis and Dissertation” (ETD) system. The “ETC Resource Center” is at <http://www.grad.usf.edu/ETD-res-main.php>. All thesis students are required to attend an ETD Workshop or complete an ETD tutorial the semester prior to graduation.

Thesis Credit hours: Thesis students will take at least six (6) credit hours of Thesis, EEL 6971. The student completing a thesis must be signed up for at least two (2) thesis hours the semester of his/her graduation.

*A student without a BS in engineering enters the MSES program by default. If the student desires to be in the MSEE program we require that their background include at least a) Circuits and, b) at least one other core course (e.g. Materials, Logic, Microprocessors, Electromagnetics or Communications); alternatively they may take additional courses before entering the program and be enrolled on a contingency basis.

*A student with a BS in Engineering (EE or otherwise) from an ABET-accredited program is eligible to enter the MSEE program. Graduates of non-ABET accredited programs are evaluated on a case-by-case basis.

Online Graduate Certificate in Wireless Engineering

The Wireless Engineering certificate recognizes post-bachelors preparation for engineering of modern wireless circuits, antennas and communication systems. The applicable course list allows significant flexibility to accommodate variability in student preparation, and course scheduling. The program allows emphasis to be placed in either circuits and antennas or systems and networks, while requiring exposure to both.

Credit toward graduate degree

Courses taken for the Wireless Engineering certificate will directly apply to an MS in Electrical Engineering, subject to the applicant's admission to USF as a degree-seeking student. Up to 12 hours of certificate courses may be applied to other degree programs with departmental approval.

Eligibility Requirements

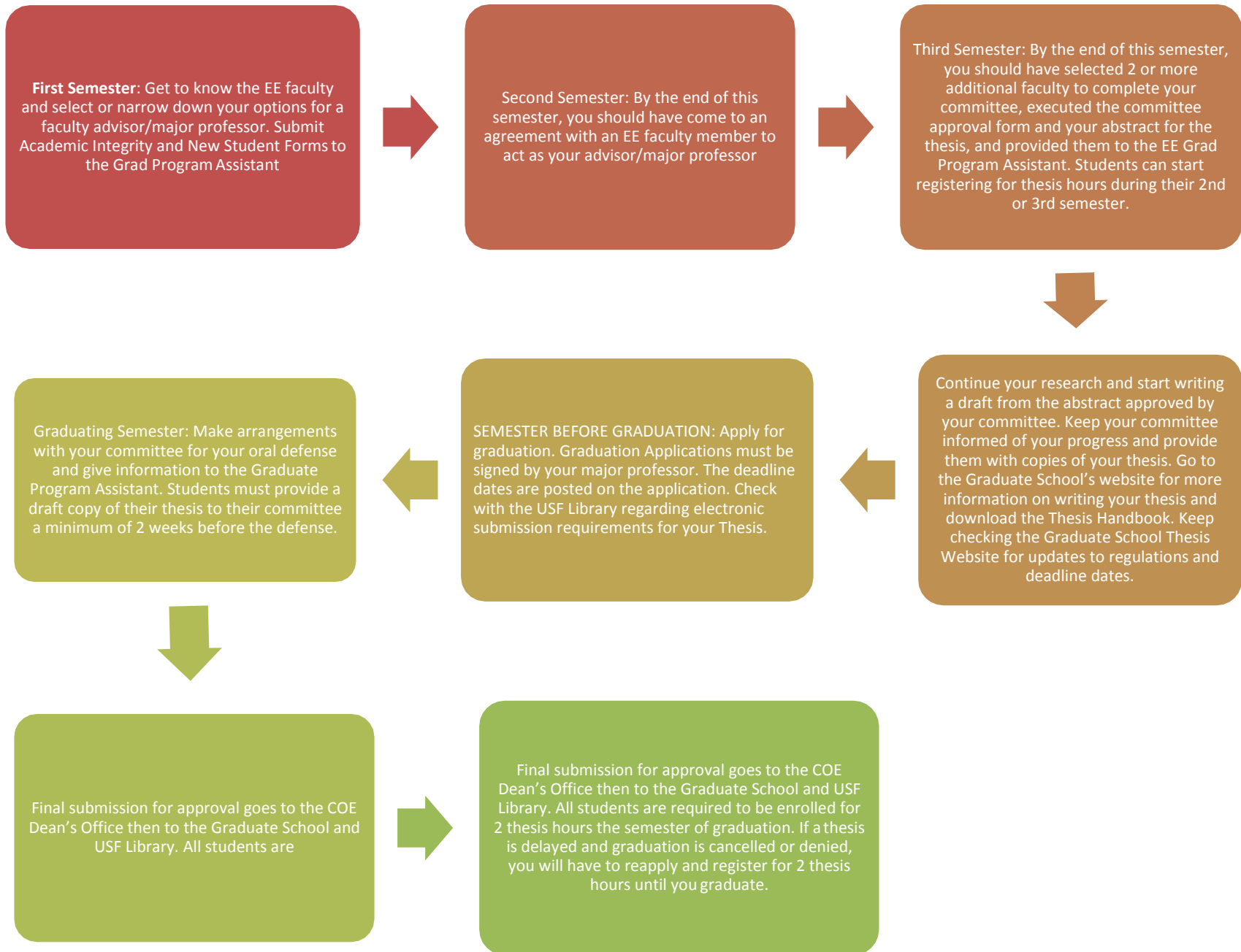
Student must complete the Certificate within six (6) years.

Incoming students are expected to have the following as prerequisites:

- Minimum Grade Point Average equivalent to B or 3.00
- B.S. in Electrical Engineering, or
- B.S. in other field (includes “hard science” majors such as physics, math, chemistry, etc.) Other majors will be considered with completion of EE undergraduate courses as advised by the department.

The course requirements for the Wireless Certificate can be found [here](#).

Electrical Engineering MS Thesis Student Semester Guide



Thesis Guidelines

The Dissertation/Thesis process is mandated by the Graduate School for all Thesis Option Master's students. Although the Graduate School no longer requires a format check, the College of Engineering continues to perform a format check and has specific deadlines which may be in advance of the Graduate School's deadlines.

It is the student's responsibility to be fully aware of the requirements of both the College of Engineering and the Graduate School and meet them. Not following the standards required may seriously impede the graduation process of the student. Provided below are some important links to help you get started with the process. Remember: Deadlines approach much faster than you anticipate!

[ETD Boot Camp Help Sessions](#): The boot camps will provide one-on-one assistance to students in the preparation of the final manuscript. For dates and times of ETD Boot Camps and/or to register, please go to: <http://www.grad.usf.edu/thesis.asp>

[College of Engineering Formatting Guide](#)

THESIS STUDENTS, PLEASE NOTE: If a student enrolled in the thesis option has taken thesis credits (EEL 6971) but elects to change to a non-thesis tract, the accumulated thesis credits cannot be exchanged or converted to another non-structured credit option. The 6971 hours will remain on the transcript and will retain the "Z" grade. If a student changes from thesis to non-thesis during a semester and is currently enrolled in thesis credits, the current thesis credits may be exchanged if a Graduate School Petition is filed with the Graduate School not later than the last day of drop/withdraw without academic penalty.

Time Limitations

All requirements for the Master's degree must be completed within five (5) calendar years from the student's date of admission for graduate study. Courses taken prior to admission to USF (transferred in or taken as a non-degree seeking student) can be no older than 7 years at the time of graduation with a Master's degree. In the event that a student nears the end of the time limitation, but needs more time to complete the degree, the student may submit a request for an extension. The request must be approved by the (Co-) Major Professor(s), Graduate Director, College Associate Dean, and Dean of the Graduate School or designee. The request must include the reasons for needing an extension and clearly state the amount of time requested, up to one year. Students who exceed the time limitations may have their registration placed on hold until a request for extension has been approved.

Students who are unable to continue in the program for more than 12 months must submit a Leave of Absence Request; this extends the time limit for the duration of the approved leave.

Both the Time Limit Extension and Leave of Absence Request Forms may be obtained at:

<http://www.grad.usf.edu/> (See "Forms")

USF Department of Electrical Engineering Doctor of Philosophy Degree

Program Description

The degree of Doctor of Philosophy is conferred in recognition of a candidate's highest level of scholarly competence and demonstrated capability to independently conduct and report significant research in Electrical Engineering. This achievement requires more than an accumulation of course credits over a stated period of residence. Scholarly competence is achieved through systematic study and investigation in the chosen discipline at an advanced level. The major professor must be from Electrical Engineering. If students have co-major professors, at least one must be from Electrical Engineering. Research capability is developed during the course of study and is achieved through the completion of significant and independent research. The results of this research must be formally presented in a written dissertation and successfully defended before an examining committee. The dissertation must demonstrate the significance of the research as well as the candidate's ability to organize and present her/his results in a professional manner.

Ph.D. Program Requirements

I. Credit Hours: The student's supervisory committee is responsible for evaluating the student's overall transcript to ensure that the following distributional requirements are met:

- (i) A minimum of 30 hours formal regularly scheduled graduate course work beyond the Bachelor's degree
- (ii) A minimum additional 9 hours in mathematics or statistics courses beyond the Bachelor's degree
- (iii) A minimum of 20 hours dissertation (EEL 7980).
- (iv) A minimum of 72 graduate hours beyond the Bachelor's degree.
- (v) Students entering the doctoral program with an earned master's degree from another institution other than USF must take at least nine (9) credit hours of 6000 level EE courses at USF, including 2 hours of the EE Graduate Seminar course to be taken once before candidacy and the second time before graduation

Students with an MSEE from USF typically begin the Ph.D. program with 24 credits in category (i), and 6 credits in category (ii). A typical PhD program would meet the remaining requirements with: 3 hours math, 6 hours regularly scheduled courses in area of concentration, 10-13 hours directed research, directed study, seminar, or course work, and 20 hours dissertation research.

Master's Degree Credit from another University: Students entering the EE doctoral program with a Master's degree from another program/university are usually awarded up to 30 credit hours for that degree. The student's major professor and committee shall determine which of the distribution requirements and the number of credit hours that are satisfied by these courses.

NOTE: The Registrar's Office will automatically credit these 30 hours towards your doctorate, but your committee may elect not to accept all of them and a doctoral student may have to complete more EE courses to qualify for a doctorate.

II. Ph.D. Examinations

Doctoral Qualifying Exam (DQE): Passing a DQE is required of all doctoral students by USF [see USF Graduate School Catalog (page 75)]. The purpose of the DQE is to measure the aptitude and capability of the student for productive independent research in electrical engineering, as well as to demonstrate the student's in-depth knowledge of their chosen research domain.

The DQE consists of a written research paper comprising an annotated literature survey in the student's chosen research area, a discussion and comparison of the prior art in this field, and identification of a promising research area and problem domain(s) of interest to the student and advisor. The research paper is presented in a meeting to a DQE examining committee that is selected by the Graduate Program Coordinator in consultation with the major professor. The research paper is made available to the examining committee at least two weeks before the meeting. The DQE examining committee is not the same as the subsequent doctoral committee and may not be headed by her/his research advisor. At least two of the committee members have taught courses that the student has taken; the major professor will select committee members with graduate coordinator approval. Faculty committee members outside of Electrical Engineering and the College of Engineering are permitted if they have instructed courses that the presenting student has taken toward the PhD in Electrical Engineering.

The typical time for the DQE exam is 1.5 hours with 45 minutes allocated for the presentation, 30 minutes for questions on the presentation and in the research domain of the candidate. The committee will then meet in private for 15 minutes to evaluate the candidate. At the discretion of the chair, questions may be asked during the presentation, but the overall time for presentation and questions should be 1.25 hours.

During the DQE meeting the discussion of the written research project will be supplemented by an oral examination of the student's research area (perhaps with an additional minor area) to further assess the likelihood of successful completion of the doctoral degree program. The DQE meeting is closed to the general public and only attended by the student presenting and his/her designated committee.

The DQE must be taken within the first calendar year at USF for students entering the PhD program with a MS. For students entering in the fall, the exam must be taken during the fall semester in the following year. For students entering the PhD program with a BS the DQE must be taken no later than the third semester, not including summer. Students entering during the summer semester will take the DQE two Fall semesters after admission, assuming they have a Master's degree. Those students who don't have a Master's will take it two spring semesters post admission.

Evaluation Rubric: After the DQE, the chair of the examining committee will fill out an examination rubric summarizing the committee's assessment of the student's performance on this exam. This information will be used for programmatic assessment and may also be used to provide useful feedback to the student. The examining Committee Chair will return the completed rubric to the EE graduate program office. All DQE submissions will be made available, upon request, to future students and faculty with the author's information redacted to aid in academic preparation and continuity.

If the student does not pass the DQE, one more attempt is allowed. The exam must be taken the next semester. If the student does not pass the DQE after the second attempt they will be discharged from the EE PhD program.

If the student passes the DQE then their research committee may be formed and chaired by their major professor. The Doctoral Committee Doctoral Committees must be comprised of 5 committee members: The Major Professor or one Co-Major Professor must be from student's home department, at least 2 departments from College of Engineering represented, and at least 1 member from outside the College of Engineering (faculty members from other universities who have Engineering degrees may be committee members). A CV is required for any non-USF member.

The candidate's committee will schedule at least two further meetings before Candidacy:

- a. Meeting I: the committee will review the student's course work to make sure that all requirements have been met. As noted above, the student and committee MUST write a formal doctoral plan (signed by all committee members) showing all course work to be counted toward the Ph.D. degree. This plan will be approved at this meeting.
- b. Meeting II: the student will make a research proposal to the committee that describes the research problem area, initial results, and the goals of the proposed research that are expected to be met prior to the dissertation defense.

III. Candidacy: After satisfactory completion of the Doctoral Qualifying Examination and satisfactory completion of Meetings I and II (described above), the student shall submit an "Application to Candidacy" form to the Graduate School. Doctoral students are not allowed to register for dissertation hours until the semester AFTER they have been admitted to candidacy. Directed research hours cannot be exchanged for dissertation hours. All course work MUST be completed by the semester before a student is admitted to candidacy. Also: after students are admitted to candidacy, they do not register for directed research hours again. Doctoral students MUST be registered the semester they apply for candidacy. No incomplete or missing grades are allowed. See the graduate school web site for deadlines and forms.

IV. Dissertation Defense: The final oral defense of the dissertation is the final exam for the Ph.D. degree. The student's major professor is the best guide to the preparation for the defense and in preparing the student to tackle the final defense of the dissertation. The student should be aware that the defense will be graded according to the attached rubric and that the committee decision is to either pass or fail the dissertation defense.

V. Residency and Time

Time Limitations: Doctoral degrees must be completed within seven (7) years from the student's date of admission for doctoral study. There is no time limitation for courses from a completed Master's degree used toward a doctoral degree. For students who are readmitted, see Readmission Policy.

Time Limit Extensions: In the event that a student nears the end of the time limitation as specified above, but the student needs more time to complete the degree, the student may submit a request for an extension using the Time Limit Extension Request Form, available on the Graduate School website. If approved, the time limit extension also applies to courses applied toward the degree. However, programs may require additional or repeat course work as part of the condition of the time limit extension. Students who exceed the time limitations may have their registration placed on hold until a request for extension has been approved. Only one time limit extension request is permitted. Students who are temporarily unable to continue the program should submit a Leave of Absence Request, which extends the time limit for the duration of the approved Leave (see Leave of Absence in the Enrollment

Requirements section for information; the [Leave of Absence Request Form](#) is available online at the Graduate School's website.

The typical progression towards the PhD is shown in the flow chart below [summer semesters are not counted]:

Electrical Engineering PhD Student Semester Guide



MS and PhD Graduation

It is a College of Engineering Regulation that graduate students in the Masters coursework option apply for graduation the semester before the one in which they wish to graduate. Graduate students in the master's program doing a thesis and doctoral students will follow the university graduation application dates by applying for graduation in the semester of graduation.

All graduate students must be enrolled a minimum of two hours their semester of graduation.

International Students must know the rules and regulations for credit hours to be taken to stay in compliance with I-20 and visa regulations for each semester until graduation. International students who do not follow INS/ISSS regulations may find that they may be required to retroactively enroll for needed credit hours in order to stay in compliance. There will be no tuition waivers granted in these cases. International students cannot cancel their graduation if all requirements for the degree have been met the semester they have applied for without express approval of an ISSS advisor.

PLEASE NOTE: Because Engineering students are required to turn in their graduation application early, if their choice of course(s) for the semester of graduation changes, for any reason, Engineering Advising and EE must be informed.

To qualify for graduation:

1. All "I" and "M" grades must be cleared.
2. Appropriate transfer courses must be approved and posted to your record.
3. You must have a minimum GPA of 3.0 for a MS and 3.25 for a PhD.
4. Appropriate course work must be close to completion; AND any appropriate committee and forms must have been approved by the EE Department, College and the Graduate School.

All students are responsible for knowing the rules for their academic program. Most of the regulations for the EE Department are in this handbook. Students must also regularly check USF's Graduate School website, Electrical Engineering's website, the College of Engineering website, and the official USF Graduate Catalog for updates.

If you are canceled or denied graduation for any reason, you must reapply for graduation the next semester you are eligible, and by the deadline dates.

Students participating in graduation ceremonies are doing so before graduation certification is finalized. ALL potential graduates are subject to final approval or denial by the College of Engineering. Diplomas are mailed by the Registrar's Office a month to six weeks after your official graduation and after all graduation checks are completed.

Helpful information (links to university services)

[Tampa Bookstore](#)- The Tampa campus bookstore offers a full selection of your required textbooks, USF gifts/apparel, graduation invitations and regalia, a Starbucks coffee shop and other books for personal leisure reading.

[USF Career Center](#)- USF's career center supports you in your process of dreaming, planning, and achieving career goals. They teach you how to use a strategic approach in planning for a career path and job search. Their office helps you self-assess, learn how to conduct career research, seek out experiences that will give you transferable skills, and search for full-time employment.

[Graduate Catalogs](#)- A listing of all of the most current policies, rules and procedures for Graduate Students at USF

[Office of Financial Aid](#)- The office at USF that assists you with your scholarship and loan information

[International Graduate Admissions](#) – Admission assistance for incoming International students

[International Student Services](#)- This is the office that regulates immigration requirements and academic rules for International Students

[Office of the Registrar](#)- The Registrar's office assists students with transcripts, graduation application, forms such as residency and change of name/address.

[Parking and Transportation Services](#) – This is where you purchase your permits and pay tickets.

[Residency Classification](#) – The website you must go to in order to change your residency

[Schedule Search](#) – Where you will search for your classes

[Student Health Services](#) – Student insurance, immunization, medical care, etc.

[Student ID Card](#) – The USFCard is the official identification card of the University of South Florida. The USFCard is a multi-functional card with digitized photo and electronic identification and validation for departments needing to verify student and/or employee status. The USFCard was designed as a platform for a multitude of services and functions. The cost for your original card is \$10.00

[Tuition and Fees](#) – Tuition payments and questions can be addressed here, including information regarding student financial services, refunds, edeposit, tuition waivers and 3rd party billing.

Appendix A: Electrical Engineering Faculty



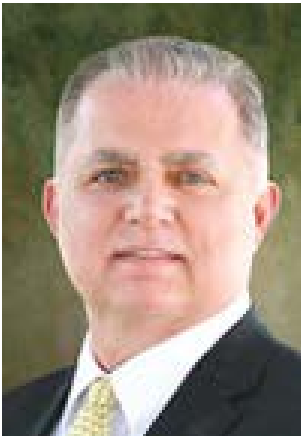
Huseyin Arslan, Ph.D., Professor and Fellow of the IEEE, Southern Methodist University (1998)

Dr. Arslan's research interests are related to advanced signal processing techniques at the physical layer, with cross-layer design for networking adaptivity and Quality of Service (QoS) control. He is interested in many forms of wireless technologies including cellular, wireless PAN/LAN/MANs, fixed wireless access, and specialized wireless data networks like wireless sensors networks and wireless telemetry. The current research interests are on UWB, OFDM based wireless technologies with emphasis on WIMAX and IMT-Advanced, and cognitive and software defined radio.



Sanjuktha Bhanja, Ph.D., Professor and Associate Dean for Academics and Student Affairs, University of South Florida (2002)

Dr. Bhanja's research thrust is toward Nano-Computing using Beyond-CMOS Emerging Technologies: modeling, fabrication, characterization and design automation harnessing unique properties of the nano-devices. Her recent works focus on nano-magnetic logic, spin-couple computing, organic spintronics, straintronics, resistive logic/memory in creating unique computing paradigm. The target application domains are futuristic programmable magnetic grids for Computer Vision applications, Data-centric Embedded/Secured computing, Graphical Probabilistic Models for Stochastic High Performance Computing and Next generation Memories.



Robert H. Bishop, Ph.D., P.E., Professor and Dean, Rice University (1990)

Dr. Bishop is a specialist in the area of systems theory, guidance and control of aerospace vehicles, and navigation and estimation theory with applications across a broad range of global challenges. His current research interests are in the area of advanced navigation algorithm development with fast-to-flight characteristics, integrated navigation and guidance for planetary precision landing, small satellites and unmanned aerial vehicles. Dr. Bishop was selected twice as a Faculty Fellow of the NASA Jet Propulsion Laboratory and as a Welliver Fellow of the Boeing Company.



Alexandro Castellanos, Ph.D., Instructor, University of South Florida (2006)

Dr. Castellano's research interests lie in the area of cyber physical systems, embedded systems, Internet of things (IoT) and control theory for industrial applications in the areas of Mechatronics and Industrial Automation



Morris Chang, Ph.D., Professor, North Carolina State University (1993)

Dr. Chang's research interests are in the broad area of computer and wireless networking systems, with recent emphasis on cybersecurity: Attribution, Program Analysis for cybersecurity and privacy-preserving Internet Computation; Energy-aware mobile and cloud systems; Energy-efficient wireless networks.



Kwang-Cheng Chen, Ph.D., Professor and Fellow of the IEEE at University of Maryland, College Park (1989)

Dr. Chen's research interests lie in information communication technology essential to digital society, particularly in large networks and computations. Specific interests include large communication networks: Internet of Things, Cyber-Physical Systems and Edge Computing, 5G Mobile Communications and Beyond, Ad Hoc Sensor Networking, In-Network Computations and Approximate Computing, Cognitive Radio Networks, Secure Communications and Resilient Networks; Large Information Networks: Social Networks, Big Data Analytics, Multi-Agent Systems and Collective Behavior, Fusion and Decision on Heterogeneous/Multimodal Data, Biochemical Reaction Networks and Applications to Synthetic Biology and Systems Biology, Decision under Uncertainty, and Cybersecurity and Privacy



Larry Dunleavy, Ph.D., Professor, University of Michigan (1988)

Dr. Dunleavy's research interests are related to microwave and millimeter-wave device, circuit and system design, characterization and modeling.



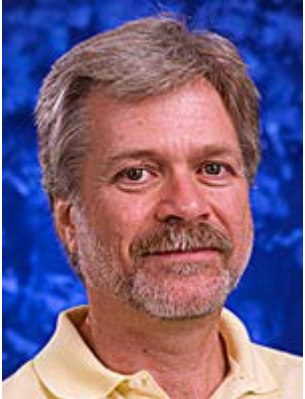
Lingling Fan, Ph.D., P.E., Associate Professor, West Virginia University (2001)

Dr. Fan's research is focused on renewable energy source grid integration, modeling and control of energy systems, large-scale power system planning and operation



Ralph Fehr, Ph.D., Instructor II, University of South Florida (2005)

Dr. Fehr's research interests include power system planning methods and reliability enhancement techniques, infrastructure design improvements, high-power semiconductor applications at medium voltages, and engineering education reform.



Christos Ferekides, Ph.D., Professor, University of South Florida (1991)

Dr. Ferekide's research interests include thin-film electronic materials and devices for optoelectronic applications; thin film depositions and properties; device fabrication and characterization.



Nasir Ghani, PhD, Professor, University of Waterloo, Canada

Currently Dr. Ghani is involved in a wide range of research activities in the areas of cyberinfrastructure design, networking, disaster recovery, cloud computing, and cyber-physical systems (integrated power grids). In addition, his research has been supported by the National Science Foundation, Defense Threat Reduction Agency, Department of Energy, Qatar Foundation, Department of Education, and Sprint-Nextel Corporation. He also received the NSF CAREER Award in 2005 for his work on multi-domain networking as well as the UNM Lawton-Ellis Award in 2011 for excellence in research, teaching, and outreach.



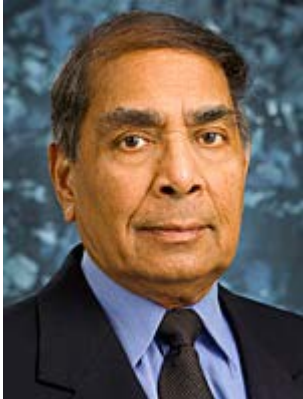
Richard D. Gitlin, Sc. D., Columbia University (1969); Distinguished Professor, Agere Systems Chair, State of Florida 21st Century Scholar, National Academy of Engineering, and Fellow of the IEEE.

Dr. Gitlin's research interests are communications and networking systems for wireless and wired media. His current focus is wireless networking of intelligent bio-medical systems, with an emphasis on advanced communications and network protocols to realize high-speed and ultra-reliable *in vivo* wireless networks that are intended to create a paradigm shift in disciplines such as minimally invasive surgery, cyber-physical healthcare systems, and sensor networks.



Drew Hoff, Ph.D., Professor and Graduate Program Coordinator, Penn State University (1988)

Dr. Hoff's research interests include: Afterglow chemical processing of materials for electronics, sensor, and MEMS applications; Oxide formation on Si & SiC, Diamond processing, Surface Conditioning, Noncontact Corona Kelvin Metrology of electronic materials; Dielectrics, SiC, Corona Ion-Assisted delivery of drugs and DNA to Skin and Tissue, Noncontact voltage and corona characterization of cells and tissue, Contamination monitoring and control in IC Manufacturing, Microsystem and MEMS fabrication, Integrated Circuit manufacturing and in-line testing, and Workforce development and training for technology professionals.



Vijay K. Jain, Ph.D., Professor, Michigan State (1964)

Dr. Jain's research interests are biomedical systems, biomedical imaging and biomedical image processing, communication systems and networks, digital image and video processing. VLSI implementations; system on a chip (bio-sensing, DNA microarrays, opto-electronics, MEMS, digital, analog), and 3-D SOCs.



Chung Seop Jeong, Ph.D. Instructor, Marquette University (2007) Dr. Jeong's research interests lie in the area of control systems with specialty in designing resilient, robust, optimal, and adaptive observers and controllers for linear, nonlinear, stochastic, and chaotic systems.



Selcuk Kose, Ph.D., Assistant Professor; University of Rochester (2012)

Dr. Kose's research interests are in the broad field of integrated circuits and VLSI systems, with a primary emphasis on circuit design techniques, power grid analysis algorithms, mathematical methods to characterize power grids, power delivery challenges in 3-D integrated circuits, noise issues in on-chip interconnection networks, design and analysis of clock distribution networks. and resistive memories.



Zhuo Lu, Ph.D., Assistant Professor, North Carolina State University (2013)

Dr. Lu's research interests broadly include network science, cyber security, data analytics, wireless and mobile communication networking, and cyber-physical systems.



Zhizin Miao, Ph.D., P.E, Assistant Professor: West Virginia University, (2002)

Dr. Miao's research interests include smart grid automation, electric power system modeling and simulation, microgrid technologies to integrate renewable energy and energy storage, and power market.



Don Morel, Ph.D., Professor, Tulane (1971)

Professor Morel's research interests include: Photovoltaic solar energy with particular emphasis on the development of thin film solar cells of CuInGaSe_2 , CdTe and CdSe , amorphous Si , and organic materials; transparent conductors including ZnO , SnO_2 , ITO ; I-III-VI₂ and II-VI materials and devices; high efficiency thin film tandem solar cells, photovoltaic device modeling and simulation; photodetectors, thin film transistors and memory devices, LED's, and x-ray and gamma ray detectors; and physical vapor deposition including sputtering, evaporation, close space sublimation and scale up to pre-manufacturing.



Wilfrido A. Moreno, Ph.D., Professor, University of South Florida (1993)

Dr. Moreno's research interests are: Energy, Power Electronics and Controls Option Supervisor-Primary areas of interest include System integration for industrial applications in the areas of Industrial Controls & Instrumentation, Robotics, Digital Signal Processing, Reconfigurable Architectures, Analog-Digital Mixed Signal Design & Synthesis, Communications and Biomedical Engineering. Other areas of current interest are the use of Lasers in developing new methods and techniques for electronic circuitry interconnects and test validation of VLSI fault tolerant designs, Laser Restructuring for quick prototyping of electronic circuits; laser machining and Multimedia & Instructional Technologies Solutions for Engineering Education including Distance Learning.



Salvatore (Sal) D. Morgera, Ph.D., P.E., FIEEE; Professor, Brown University (1975)

Dr. Morgera's research interests are: biomedical engineering, secure telecommunications networks-biometrics for Identity Management in a Wireless Networked Environment.; high performance computing; and design and implementation of internet based control systems.



Gokhan Mumcu; Ph.D., Associate Professor, Ohio State University, (2008)

Dr. Mumcu's research is focused on electromagnetic theory, computational electromagnetics, THz imaging systems, metamaterials and their applications to small directive radiators and printed miniature antennas.



Ashwin B. Parthasarathy, Ph.D., Assistant Professor, University of Texas at Austin (2010)

Dr. Parthasarathy's research interests are in the development of novel biomedical instrumentation and imaging techniques with optics, and the clinical translation of these medical devices for applications that include bedside diagnoses/monitoring of brain injuries (e.g., strokes, traumatic brain injury), intraoperative imaging, and critical care monitoring. The ultimate goal of Dr. Parthasarathy's research is utilize these custom clinical biomedical devices and directly measure tissue physiology at the bedside, thereby developing non-invasive biomarkers of disease, bedside disease models, and thus personalized optimization of treatment..



Stephen E. Saddow, Ph.D., Professor, University of Maryland at College Park (1993)

Dr. Saddow's research interests are to develop wide-bandgap silicon carbide semiconductor materials for Bio, Nano and MEMS applications His ultimate research objective is to develop smart implants and sensors for biomedical and harsh environment applications. Prof. Saddow was jointly appointed in 2009 to the college of medicine where he is working to develop 3C-SiC based devices for insertion into the nervous system. The goal is the realization of brain-machine-interface (BMI) devices based on SiC. His group has demonstrated the biocompatibility of SiC with neural cells, both in-vitro and in-vivo, and has demonstrated the biocompatibility of epitaxial graphene on SiC.



Ravi Sankar, Ph.D., P.E., Professor, Penn State University (1985)

Dr. Sankar's main research interests are in the areas of wireless communications, networking, and signal processing and its applications. In particular, he is interested in the resource and mobility managements of wireless cellular, ad-hoc, and sensor networks, energy-efficient design and cross-layer optimization. He is further interested in processing, coding, and recognition applications to speech, image, biomedical and other signals and in integrating intelligent techniques including the use of neural networks and fuzzy logic in the simulation, modeling, and design of high performance and robust systems.



Rudy Schlaf, Ph.D., Professor, Technische Universitat Berlin, Germany (1995)

Dr. Schlaf's main research interests currently span the following areas: Spray based deposition of macro-molecular thin films and interfaces, photoemission spectroscopy on organic semiconductor/bio-materials interfaces, work function measurements, directed assembly of macromolecular materials, biosensors, thin film photovoltaics, and electronic structure and growth phenomena of atomic layer deposition thin films.



E. K. Stefanakos, Ph.D., P.E., Professor, Washington State (1969)

Research interests: clean energy; photovoltaics.



Arash Takshi, Ph.D., Associate Professor, University of British Columbia, (2007)

Dr. Takshi's primary research interest research is in the field of renewable energy. In particular, he is interested in the research on bio/organic solar cells. He believes that employing new materials can push the limits in solar cells, beyond what silicon technology can offer. Furthermore, using emerging materials, new devices with special features can be developed to address some of the existing challenges in the application of renewable energy.



Sylvia Thomas, Ph.D., Associate Professor, Howard University (1999)

Dr. Thomas' research and teaching endeavors are in the areas of Advanced Materials for applications in alternative energy sources, sustainable environments, and bio-applications for nano-electro mechanical system (NEMS) devices – nanowires and nanoparticles. Her research explores the chemical vapor deposition (CVD) growth nucleation, film characterization, and device fabrication of III-V and II-IV materials, such as AlN and SiC. Her research is interdisciplinary in nature and fosters collaborations with Chemical and Biomedical and Mechanical Engineering, Physics, Chemistry, Public Health, Medicine, and the Nanomaterials and Nanomanufacturing Research Center (NNRC).



Ismail Uysal, Ph.D., Assistant Professor, University of Florida (2008)

Dr. Uysal's research interests include applications of wireless and radio frequency identification (RFID) technologies to supply chain for food and pharmaceuticals, remote environmental modeling, adaptive algorithms for smart sensory data processing and other auto-ID systems.



Jing Wang, Ph. D.; Associate Professor, University of Michigan (2006)

Dr. Wang's research interests include nano/microfabrication, nanomaterials, RF MEMS devices, on-chip power generation, microfluidics, MEMS transducers, RF integrated circuit, wide bandgap materials, polymer nanocomposite and responsive polymers.



Thomas Weller, Ph.D., Professor and Chair, University of Michigan (1995)

Dr. Weller's current research interests are in the areas of planar and electrically-small 3D antennas, development and application of novel microwave materials, additive manufacturing for RF/microwave design, and electromagnetic sensors.



Yasin Yilmaz, Ph.D., Assistant Profesor, Columbia University (2014)

Dr. Yilmaz's research interests include statistical data and signal analysis, machine learning, multimodal data fusion, event-driven systems, object-oriented modeling, and sequential analysis with applications in cybersecurity, big data, social networks, smart grid, smart city and intelligent transportation systems, autonomous driving, wireless communications, IoT, and cyber-physical systems.

Areas of Research Interest

Bioelectrical Engineering

• Dr. Andrew Hoff, Dr. Vijay Jain, Dr. Ashwin Parthasarathy, Dr. Stephen Sadow

Circuits, Electronics, Networks, and Systems

• Dr. Robert Bishop, Dr. Nasir Ghani, Dr. Chung Seop Jeong, Dr. Wilfrido Moreno, Dr. Sylvia Thomas, Dr. Ismail Uysal, Dr. Paris Wiley

Communication Systems and Signal Processing

• Dr. Huseyin Arslan, Dr. Kwang-Cheng Chen, Dr. Nasir Ghani, Dr. Richard Gitlin, Dr. Salvatore Morgera, Dr. Ashwin Parthasarathy, Dr. Ravi Sankar, Dr. Yasin Yilmaz

Digital Circuits and Systems

• Dr. Sanjukta Bhanja, Dr. Vijay Jain, Dr. Selcuk Kose, Dr. Ashwin Parthasarathy

Electromagnetics RF and Microwaves

• Dr. Larry Dunleavy, Dr. Gokhan Mumcu, Dr. Ismail Uysal, Dr. Jing Wang, Dr. Thomas Weller

Energy and Power Systems

• Dr. Lingling Fan, Dr. Ralph Fehr, Dr. Nasir Ghani, Dr. Zhixin Miao, Dr. Lee Stefanakos

Materials and Semiconductors

• Dr. Chris Ferekides, Dr. Andrew Hoff, Dr. Don Morel, Dr. Stephen Sadow, Dr. Rudy Schlaf, Dr. Arash Takshi, Dr. Sylvia Thomas

Networking and Security

• Dr. Morris Chang, Dr. Kwang-Cheng Chen, Dr. Nasir Ghani, Dr. Richard Gitlin, Dr. Zhuo Lu, Dr. Yasin Yilmaz