

Graduate Advising Handbook

Department of Electrical Engineering

College of Engineering & Computer Science

Wright State University



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1 Purpose

The Department of Electrical Engineering offers a program of study leading to a Master of Science in Engineering degree with a major in electrical engineering. The program permits concentration of study in specific areas of electrical engineering such as signal processing, wireless communications, control theory, microwave, power electronics, and integrated circuits. Most classes are offered after 4:00 p.m. to serve the educational needs of the practicing engineering professional as well as the full-time student. This document addresses questions that frequently arise in the advising process.

2 Department of Electrical Engineering

2.1 Programs

The department is one of four in the College of Engineering and Computer Science and offers three degree programs. At the undergraduate level is an ABET accredited Bachelor of Science in Electrical Engineering program. At the graduate level, the department offers a Master of Science in Engineering degree with a major in Electrical Engineering. The M.S.E. program is the focus of this document. The college offers a Ph.D. in Engineering. A student may choose to focus on doctoral studies in an electrical engineering area.

2.2 Points of Contact

The department's administrative offices are located in 311 Russ Center. The EE Graduate Program Director and student advisor can be reached through the department office. The mailing address is: Department of Electrical Engineering, Wright State University, Dayton, OH 45435. The telephone number is 937-775-5037, the fax number is 937-775-3936 and our web site is <http://www.cecs.wright.edu/ee/>.

2.3 Faculty

The department has twenty faculty members conducting research and offering courses in the electrical engineering body of knowledge. Information on each faculty member is listed below.

- *Joshua Ash* (937-775-3983, josh.ash@wright.edu, 425 Russ Center), Assistant Professor, Ph.D., The Ohio State University, 2007. Research interests include: statistical signal processing and large-scale Bayesian inference with applications in sensor and image processing, hyperspectral imaging, and synthetic aperture radar.
- *Elliott Brown* (joint appointment with Physics) (937-775-4903, elliott.brown@wright.edu, 109 University Park), Professor, Ph.D., California Institute of Technology, 1985. Research interests include: mmwave and THz mixers made from semiconductor hot-electron bolometers and magnetically-quantized photoconductors.
- *Henry Chen* (937-775-5056, henry.chen@wright.edu, 325 Russ Center), Professor, Ph.D., University of Minnesota, 1989. Research interests include: VLSI/FPGA/GPU based on demand targeted to CMOS nanotechnologies which includes digital, analog

and mixed-signal integrated circuits for signal processing, communication, radar and ultra wideband receivers.

- *John (Marty) Emmert* (937-775-5023, marty.emmert@wright.edu, 338 Russ Center), Professor, Ph.D., University of Cincinnati, 1999. Research interests include: physical design automation for VLSI, VLSI systems, physical VLSI design, reconfigurable systems, digital CD, VHSIC hardware description language (VHDL), verilog, digital design, VLSI interconnections, analog integrated circuit design, signal processing, digital control systems.
- *Fred Garber* (937-775-5033, fred.garber@wright.edu, 312 Russ Center), Associate Professor, Ph.D., University of Illinois, 1983. Research interests include: communication systems, target recognition, information theory, and pattern theory.
- *Steve Gorman* (937-775-5783, steve.gorman@wright.edu, 329 Russ Center), Instructor, Ph.D., University of Kentucky, 1988. Research interest include: signal and communication processing related to geolocation of modern signal transmitters including cellular and PC devices.
- *Lang Hong* (937-775-5053, lang.hong@wright.edu, 442 Russ Center), Professor, Ph.D., University of Tennessee, 1989. Research interests include: computer vision, image processing and pattern recognition, robotic sensing and control, multisensor systems, stochastic systems, system modeling and estimation, and multitarget tracking.
- *Marian Kazimierczuk* (937-775-5059, marian.kazimierczuk@wright.edu, 418 Russ Center), Professor, Ph.D., Technical University of Warsaw, 1978. Research interests include: electronic circuit analysis, high-frequency tuned power amplifiers, power electronics, dc-dc PWM and resonant power converters, modeling and control of power converters, magnetic components, and renewable energy sources.
- *Pradeep Misra* (937-775-5062, pradeep.misra@wright.edu, 424 Russ Center), Associate Professor, Ph.D., Concordia University, 1987. Research interests include: multivariable control theory, robotics and applied numerical analysis.
- *Doug Petkie* (joint appointment with Physics) (937-775-3124, doug.petkie@wright.edu, 243 Fawcett Hall), Associate Professor, Ph.D., The Ohio State University, 1996. Research interests: spectroscopy of atmospheric and interstellar related molecules, microwave, mm-wave, and THz sensing and imaging.
- *Teri Piatt* (937-775-2757, teri.piatt@wright.edu, 415 Russ Center), Lecturer, Ph.D., University of Colorado, 1999. Research interests include: technical communications, circuits, linear systems, and control systems.
- *Kuldip Rattan* (937-775-5052, kuldip.rattan@wright.edu, 108 Russ Center), Professor Emeritus, Ph.D., University of Kentucky, 1975. Research interests include: control theory, robotics, verification and validation of cyber-physical systems (CPS).
- *Saiyu Ren* (937-775-5051, saiyu.ren@wright.edu, 328 Russ Center), Associate Professor, Ph.D., Wright State University, 2008. Research interests include: RF and mixed signal integrated circuit design with applications to wireless transceivers, communications and signal processing.
- *Brian Rigling* (937-775-5100, brian.rigling@wright.edu, 311 Russ Center), Professor

and Chair, Ph.D., The Ohio State University, 2003. Research interests include: sensor signal and image processing, system engineering and modeling.

- *Michael A. Saville* (937-775-5169, michael.saville@wright.edu, 422 Russ Center), Assistant Professor, Ph.D., P.E., University of Illinois at Urbana-Champaign, Illinois, 2006. Research interests include: Computational and applied electromagnetics; radar measurement and physics-based modeling of sensor signal processing.
- *Arnab Shaw* (937-775-5064, arnab.shaw@wright.edu, 427 Russ Center), Professor, Ph.D., University of Rhode Island, 1987. Research interests include: sensor signal and image processing, automatic target recognition, hyperspectral image processing, high resolution angles of arrival estimation, and vibrometry based target recognition.
- *Raymond Siferd* (937-775-5058, ray.siferd@wright.edu, 324 Russ Center), Professor Emeritus, Ph.D., Air Force Institute of Technology, 1977. Research interests include: very large scale integrated circuit design, signal processing and analog integrated circuit design.
- *Zhiqiang (John) Wu* (937-775-5060, zhiqiang.wu@wright.edu, 481 Joshi Center), Associate Professor, Ph.D., Colorado State University, 2002. Research interests include: wireless communication and networking, cognitive radio and dynamic spectrum access, cognitive RF, multi-carrier transmission, underwater acoustic communication.
- *Jiafeng Xie* (937-775-5161, jiafeng.xie@wright.edu, 230 Russ Center) , Assistant Professor, Ph.D., University of Pittsburgh, 2014. Research interests include: VLSI cryptographic systems, VLSI signal/image processing systems.
- *Kefu Xue* (937-775-5037, kefu.xue@wright.edu, 313 Russ Center), Associate Professor, Ph.D., Pennsylvania State University, 1987. Research interests include: digital image processing, computer vision and special purpose architecture for signal processing.
- *Xiaodong (Frank) Zhang* (937-775-4463, xiaodong.zhang@wright.edu, 335 Russ Center), Associate Professor, Ph.D., University of Cincinnati, 2001. Research interests include: Fault diagnosis and prognosis, fault-tolerant control and contingency management, intelligent control and adaptive systems, distributed and cooperative control, verification and validation of complex control systems.
- *Yan Zhuang* (937-775-4556, yan.zhuang@wright.edu, 421 Russ Center), Associate Professor, Ph.D., Johannes Kepler University, Linz, Austria, 2000. Research interests include: RF and microwave technology, magnetic materials, nano-composite materials, high speed Si-based electronics, MEMS/NEMs, micro aerial vehicle and sensors.

2.4 Facilities

Access to modern equipment, instrumentation, and computer systems similar to those used by industry is a critical part of an engineering education. Laboratories specifically dedicated to student and faculty research exist in the areas of robotics, heat transfer, fluid dynamics, microprocessors, mechanical vibrations, signal processing, analog and digital electronics, microwave devices, nanotechnology, MEMS, VLSI design, materials testing, materials processing, electron microscopy, augmentative communications diagnostic

ultrasonics, medical imaging, man-machine displays, and visual displays. Students have access to a wide range of computer systems interconnected by local and wide-area networks. Access is also available to the Ohio Supercomputer via the Ohio Academic and Research Network (OARNET).

3 M.S.E. (in Electrical Engineering)

3.1 Admission

3.1.1 Application Process for US Citizens and US Permanent Residents

Applications for admission are to be submitted to [The Graduate School](#) which has the responsibility for administering graduate programs at Wright State University. Upon completion of an admission package (which must include official transcripts of all post high school education), it is forwarded to the EE department for review and recommendation. Departmental admission recommendations are sent to the Office of the Dean of the College of Engineering and Computer Science for recording and then forwarded to [The Graduate School](#) for further action.

3.1.2 Requirements

A student may be admitted to the program on a Regular status with a Bachelor of Science in Electrical Engineering or related fields from an ABET-accredited ([Washington Accord](#)) institution of higher education with a minimum electrical engineering GPA of 2.9 on a 4.0 scale.

Students with GPA below 2.9 may be admitted conditionally with a minimum undergraduate GPA of 2.7. The condition to attain Regular status is usually the achievement of a GPA of 3.0 or better in the first 2 graduate courses (or with cumulative GPA of 3.0 at any point thereafter) as specified by a department advisor.

Applicants with a non-EE bachelors or master's degree may be required to demonstrate proficiency with prerequisite material listed below.

Prerequisite Material	Equivalent WSU Course
Electrical Circuits	EE 2010
Linear Systems	EE 3210, EE 4000*
Probabilities	EE 3260
Electronics	EE 3310
Electromagnetics	EE 3450
Control Systems	EE 4130*
Digital Communications	EE 4210*

Mathematics: Calculus, Differential Equations and Linear Algebra

*The EE 4xxx courses listed above may be taken as part of MS Program of Study at the 6000-level by advisor approval.

3.1.3 Application Process for International Applicants

International students submit application materials to the Wright State International Gateway ([WSIG](#)). International students should contact WSIG regarding application deadlines, Test of English as Foreign Language (TOEFL), Learning English for Academic and Professional Purposes ([LEAP](#)), financial statements and other requirements.

International applicants with a BS in EE or related fields from a non-ABET accredited ([Washington Accord](#)) institution will be granted Regular admission status with a minimum GPA of 3.3 on a 4.0 scale. A student may be admitted to the program with Admitted Under Advisement (AUA) status if the undergraduate cumulative GPA is less than 3.3 but at least 2.9. AUA students securing a GPA of 3.0 at the end of the first semester (or with cumulative GPA of 3.0 at any point thereafter) will be given the option to join the Regular program. AUA students will be under mandatory academic advising until they attain Regular status.

3.1.4 GRE Requirement

GRE score is not required for students who have graduated from an ABET-accredited (Washington Accord) institution. Non-ABET accredited (Washington Accord) program graduates are preferred to have a combined (verbal and quantitative) GRE score of 300 (1000 under the old system) for admission to the MS-EE program.

3.1.5 Academic Deficiency

A student with an undergraduate academic deficiency may petition for admission after demonstrating the ability to perform well in graduate courses taken in a non-degree status.

3.1.6 Waivers

Waivers for any of the above requirements may be granted at the discretion of the EE Department's Director of Graduate Studies for exceptional students.

3.2 Degree Requirements

The general requirements of [The Graduate School](#) for a Master of Science Degree are set forth in the [Graduate Catalog](#). Specific departmental requirements for the Master of Science in Engineering with a major in Electrical Engineering follow.

1. Complete a Program of Study, with approval by the Graduate Program Director by the end of first term.
2. Complete at least 30 graduate credit hours (numbered 6000 or above).
3. Complete at least 24 of the 30 graduate credit hours in Electrical Engineering courses.
4. Complete at least 18 of the 30 graduate credit hours in courses numbered 7000 level or higher, with at least 12 credit hours in Electrical Engineering.
5. At most 9 credit hours of EE 7990 may be counted toward graduation via a completed

- Thesis.
6. At most 2 credit hours of EE 7900 independent study may be counted toward graduation.
 7. At most 8 hours of approved graduate transfer credit may be applied toward graduation.
 8. Elective courses must be selected from an approved list available from the EE department.
 9. No more than 6 credit hours of C grades are allowed for graduation. Of these, no more than 2 credit hours of C grades in Labs are allowed for graduation.
 10. A minimum GPA of 3.0 is required for graduation.
 11. Complete at least three (3) courses from one of the major areas listed below. At least two out of these three courses must be at the 7xxx level.

VLSI & Electronics	Controls	Signal Processing & Communications	RF & Microwave
EE 6440	EE 6120	EE 6000	EE 6100
EE 6540	EE 6130	EE 6210	EE 6400
EE 6620	EE 6170	EE 6360	EE 6420
EE 7410	EE 6190	EE 6730	EE 6460
EE 7420	EE 6560	EE 6750	EE 6470
EE 7430	EE 6600	EE 6840	EE 6700
EE 7440	EE 7020	EE 7010	EE 7080
EE 7520	EE 7200	EE 7150	EE 7430
EE 7530	EE 7270	EE 7160	EE 7440
EE 7540	EE 7280	EE 7170	EE 7460
EE 7550	EE 7560	EE 7330	EE 7470
EE 7580		EE 7350	EE 7480
EE 7590		EE 7360	
		EE 7400	
		EE 7610	
		EE 7620	

Note: Track courses in the 6000-level can be waived with commensurate undergraduate coursework.

The program of study must be documented on a department form, approved by the Graduate Program Director and, in combination with a department degree certification, provides the supporting documentation for awarding the degree. It is useful to complete a program of study early in the program to provide an efficient path to the degree and a memorandum of agreement between the student and the department for the specific degree requirements. The program of study may be amended as circumstances change.

3.3 Graduation

Each student must submit an application to receive a master's degree. Application forms may be obtained at The [Graduate School](#) office located in E344 Student Union. The application deadline is usually one month before the graduation semester begins. Specific cutoff dates are published in the semester class schedule (newsprint). Should the first graduation attempt be unsuccessful, students must re-apply for a degree on each successive attempt. Under extreme circumstances, a student may petition the Department for support

of a late application for Graduation through the first week of the semester.

Wright State holds two commencement ceremonies each year, at the end of spring and fall semesters. Students may participate in the ceremony held at the end of the graduation semester, or in the event that there is no ceremony at the end of the semester, after the graduation semester.

Degree confirmation in the form of a diploma and an official transcript of grades is usually mailed within 30 days of the graduation date to the last official address.

3.4 Course Numbering

Courses numbered 7000 and above are intended to be taken only by graduate students. Courses numbered 6000 and above are typically co-listed in the undergraduate catalog with a corresponding 4000 number and may be attended by graduate and undergraduate students. Note that a student cannot take the same course for undergraduate and graduate credit. For example, EE 4000 taken for credit as an undergraduate student cannot then be taken as EE 6000 for graduate credit. Graduate students can expect to perform additional study when compared to the undergraduate student when enrolled in a course numbered 6000 or above. Courses numbered 5000 and above are co-listed in the undergraduate catalog. These courses are usually not used to satisfy any requirement for the Master of Science in Engineering degree with a major in Electrical Engineering.

3.5 Frequently Asked Questions

For complete details, please refer to the Wright State University Graduate Catalog.

Where may I find a graduate studies catalog? The [Graduate School](#) Office in E 344 Student Union or [on-line](#).

What if I earn poor grades? You may either keep the grade or replace the grade. All students in graduate study programs are expected to maintain a minimum grade point average of 3.0. The grade of C is the minimum passing grade for graduate credit. A course taken for graduate credit in which a D is received may not be applied toward the requirements of a graduate degree.

How many credits may I transfer? Up to 8 graduate semester credits earned at a regionally accredited academic institution may be transferred to a student's graduate academic record. Acceptance of these credits is subject to approval by the department's Graduate Program Director and [The Graduate School](#). An approved Program of Study must be on file at The Graduate School before transfer credits may be posted.

How may I earn credit for independent study? Up to two semester hours of Special Problems (EE 7900) may be applied toward the degree. Independent study credits are graded on a pass/fail basis. A student desiring to perform independent study should complete an independent study contract form which may be obtained in the department's administrative office. That "contract" should define the work to be accomplished and must be approved by the faculty member and chair prior to registering for credit.

How many courses should I take? International graduate students and graduate

students who receive graduate assistantships must maintain full-time student status, which requires registration for 6 or more credit hours per semester. A typical graduate student carries a load of 8-12 credit hours per semester to make consistent progress towards graduation in 3-4 semesters.

May I drop a course? The [online academic calendar](#) schedule lists specific dates by which a course must be formally dropped to avoid earning a grade.

May I take coursework outside the Department of Electrical Engineering? The degree requirements state that at least 24 out of 30 credits must have an EE prefix. It follows that with advisor approval, a program of study may be devised to include graduate courses from other engineering departments.

4 Financial Support

4.1 Graduate Research Assistantships (GRAs)

Individual professors employ graduate students to assist them in fulfilling the requirements of research contracts or grants the professors have secured. Candidates are usually chosen based on skills demonstrated in Wright State courses. The graduate research assistant is expected to follow the thesis option for the master's degree. Students should discuss GRA opportunities with individual professors.

4.2 Graduate Teaching Assistantships (GTAs)

The terms of department supported GTA will be limited to four semesters (cumulatively) for each student. Fractional departmental GTA appointments can be awarded in conjunction with a GRA funded by the student's advisor. The GTA/GRA appointments include tuition remission and a stipend in return for 20 hours work per week. The GTA/GRAs are required to follow the thesis option for the MSE degree. A faculty research advisor is necessary to apply for open GTA/GRA positions.

4.3 Co-operative Education

The Office of Student Employment maintains a listing of employers interested in hiring co-op students. Students desiring part-time work under a co-op student arrangement should contact the College of Computer Science and Engineering liaison officer in the [Career Services Office](#) at E334 Student Union. International students must obtain approval for any off-campus coop work through the [University Center for International Education](#) (UCIE).

4.4 Hourly Employment

Many departments hire students on an hourly basis to accomplish varied tasks. The Career Services at E334 Student Union serves as a central posting agency for these opportunities. Interested persons should check the [Career Services Wright Search bulletin board](#) as well as inquire at individual department offices.