

# Graduate Advising Handbook

Department of Electrical Engineering  
College of Engineering & Computer Science  
Wright State University

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WRIGHT STATE  
UNIVERSITY

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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 co-op 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 Office of Student Employment in E334 Student Union serves as a central posting agency for these opportunities. Interested persons should check the student employment bulletin board as well as inquire at individual department offices.

Program of Study must be on file at the School of Graduate Studies 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 departments 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 research assistant is expected to follow the thesis option for the masters 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

## 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 departments 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 seventeen faculty members conducting research and offering courses in the electrical engineering body of knowledge. Information on each faculty member is listed below.

- *Elliott Brown*, Professor, Ph.D., California Institute of Technology, 1985. Research interests include: mm-wave and THz mixers made from semiconductor hot-electron bolometers and magnetically-quantized photoconductors.

- *Henry Chen*, Professor, Ph.D., University of Minnesota, 1989. Research interests include: very large scale integrated circuit design, built-in self-test design, test generation and scheduling, reduced instruction set, computer architecture and fault tolerant computing.
- *John (Marty) Emmert*, Associate Professor, Ph.D., University of Cincinnati, 1999. Research interests include: physical design automation for VLSI, VLSI systems, physical VLSI design, re-configurable systems, digital CD, VHSIC hardware description language (VHDL), verilog, digital design, VLSI interconnections, analog integrated circuit design, signal processing, digital control systems.
- *Fred Garber*, Associate Professor, Ph.D., University of Illinois, 1983. Research interests include: communication systems, target recognition, information theory, and pattern theory.
- *Russell Hannen*, Associate Professor Emeritus, Ph.D., The Ohio State University, 1969. Research interests include: electric car technology.
- *Lang Hong*, 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 Kazimierzczuk*, 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, renewable energy sources.
- *Pradeep Misra*, Associate Professor, Ph.D., Concordia University, 1987. Research interests include: multivariable control theory, robotics and applied numerical analysis.
- *Doug Petkie* (joint appointment with Physics), 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.

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?* School of Graduate Studies 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 departments Graduate Program Director and the School of Graduate Studies. An approved

**Required:**

VLSI	Control/ Robotics	Signal Proc.	Comm.	Microwave	Electronics
6540/L	6170/L	6360	6210/L	6420/L	6440/L
6620/L	7020	7610	7350	6460/L	7410/L
7530/L	7200	7620	7360	Take two:	Take two:
7580/L	Take one:	Take one:	7610	7470	7420/L
	7250	7330		7480	7430/L
	7270	7630		7440/L	7440/L
	7280				
	7560/L				

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

**Recommended electives:**

VLSI	Control/ Robotics	Signal Proc.	Comm.	Microwave	Electronics
7520/L	6120/L	7150	6780	6100	7590/L
7540/L	6130/L	7350	7400	7590/L	
7590/L	6190/L	7160	7620		
	6560/L	7170			

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 masters degree. Application forms may be obtained at the School of Graduate Studies 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.

- *Kuldip Rattan*, Professor, Ph.D., University of Kentucky, 1975. Research interests include: control theory, robotics, microprocessor applications and bioengineering.
- *Saiyu Ren*, Assistant 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*, Associate Professor, Ph.D., The Ohio State University, 2003. Research interests include: sensor signal and image processing, system engineering and modeling.
- *Arnab Shaw*, Professor, Ph.D., University of Rhode Island, 1987. Research interests include: estimation theory, spectrum estimation, and neural network based speech processing.
- *Raymond Siferd*, 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*, Associate Professor, Ph.D., Colorado State University, 2002. Research interests include: 3G cellular, CDMA systems, multi-carrier architectures, and frequency domain processing.
- *Kefu Xue*, Associate Professor and Chair, Ph.D., Pennsylvania State University, 1987. Research interests include: digital image processing, computer vision and special purpose architecture for signal processing.
- *Xiaodong (Frank) Zhang*, Associate Professor, Ph.D., University of Cincinnati, 2001. Research interests include: intelligent control, integrated health management, distributed and cooperative control and smart adaptive systems.
- *Yan Zhuang*, Assistant 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, 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

Applications for admission are to be submitted to the School of Graduate Studies 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 School of Graduate Studies for action.

International students need additional information in a complete admission package (including a TOEFL score minimum 550, computerized testing score minimum 213, internet based test score minimum 79, IELTS score minimum 6.0, and financial information). International students admission packages are sent to the International Student Admissions Office before forwarding to the EE department for review and recommendation.

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

Department personnel review admission packages for recommending admission status. Recommendation categories include regular, conditional and not admitted. A student may be admitted to the program on a regular status with a bachelors degree in electrical en-

gineering or related area and an undergraduate grade point average (GPA) of 2.9 on a 4.0 scale. A student may be admitted to the program on a conditional status when the undergraduate cumulative GPA is less than but at least 2.7. The condition of admission is usually the achievement of a GPA of 3.0 or better in the first 2 graduate courses (6-8 credit hours) as specified by a department advisor.

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.

### 3.2 Degree Requirements

The general requirements of the School of Graduate Studies for a Master of Science Degree are set forth in the Graduate Catalog. A minimum GPA of 3.0 is required. At most, 8 hours of transfer credit may be applied towards degree requirements. Specific departmental requirements for the Master of Science in Engineering with a major in Electrical Engineering follow.

- The student must complete at least 30 graduate credit hours (numbered 6000 or above) in a Program of Study approved by the Graduate Program Director.
- Of the 30 required credit hours, a minimum of 24 credits must have an EE prefix (taken at Wright State University).
- Of the 30 required credit hours, a minimum of 18 credit hours must be courses numbered 7000 level or higher. Of the 7000+ level courses, at least 12 credit hours must have an EE prefix.
- Elective courses must be selected from an approved list, which is available from the EE department.
- Under the thesis option, a completed MS thesis includes 9 thesis hours.
- At most, 2 semester hours of independent study may be counted.
- The student must complete the required courses from one of the below MS tracks.