Masters of Science in Electrical Engineering (MSEE) Handbook

Department of Electrical Engineering

College of Engineering & Computer Science

Wright State University



Updated: *October 27, 2017*

Updated March 30, 2018 (updated on Sept 21, 2018, November 30, 2021)

Updated: April 19*, 2024*

Last updated: May 21, 2025

Contents

1 Purpose 1

2 Department of Electrical Engineering. 1

2.1 Programs 1
2.2 Points of Contact 1
2.3 Faculty 2

3 M.S.E.E 4

3.1 Admission 4

3.1.1 Application Process for US Citizens and US Permanent Residents 4
3.1.2 Requirements 4
3.1.3 Application Process for International Applicants 4
3.1.4 GRE Requirement 5
3.1.5 Academic Deficiency 5
3.1.6 Waivers 5

3.2 Degree Requirements 5

3.3 Graduation 6

3.4 Course Numbering 6

3.5 Frequently Asked Questions 7

4 Financial Support 7

4.1 Graduate Research Assistantships (GRAs) 7

4.2 Graduate Teaching Assistantships (GTAs) 8

4.3 Co-operative Education 8

4.4 Hourly Employment 8

1 Purpose

The Department of Electrical Engineering offers a program of study leading to a Master of Science 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. Many graduate courses are offered after 4:00 p.m. or online 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 of Electrical Engineering (Electrical Engineering | College of Engineering and Computer Science | Wright State University) is one of four departments in the College of Engineering and Computer Science. The Department offers several degree and certificate programs:

- Bachelor of Science in Electrical Engineering (ABET-accredited)
- Bachelor of Science in Electrical and Computer Engineering Technology
- Master of Science Certificates in Electrical Engineering
    - Digital VLSI (DigiVLSI)
    - Power Electronics
    - Radio Frequency and Microwave (RFMW)
    - Radio Frequency Mixed Signal Integrated Circuit Design (RF)
    - Sensor Signal and Image Processing (SSIP)
    - Wireless Communication and Networking
- Master of Science in Electrical Engineering
- Combined B.S./M.S. in Electrical Engineering (4+1) and
- Doctorate of Philosophy in Electrical Engineering

Further information about those programs can be found in respective handbooks published by the department and at the weblinks above.

2.2 Points of Contact

The EE Graduate Program Director and student advisors can be reached through the department office:

Department of Electrical Engineering
311 Russ Engineering Center
Wright State University
Dayton, OH 45435
ph. 937-775-5037
fax 937-775-3936
wright.edu/ee

2.3 Faculty

The department is currently staffed by nineteen faculty members, with summary information listed below.

- *Joshua Ash* (937-775-3983, josh.ash@wright.edu, 425 Russ Center), Associate 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, 223 NEC), 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* (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.
- *Fred Garber* (937-775-5033, fred.garber@wright.edu, 312 Russ Center), Professor Emeritus, 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.
- *Lan*g *Hong* (937-775-5053, lang.hong@wright.edu, 442 Russ Center), Professor Emeritus, 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 Emeritus, 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 Emeritus, Ph.D., Concordia University, 1987. Research interests include: multivariable control theory, robotics and applied numerical analysis.
- *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), 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.

- *Cheryl B. Schrader* (937-775-4469, cheryl.b.schrader@wright.edu, 337 Russ), Professor, Ph.D., University of Notre Dame, 1991. Research interests include control theory and applications.
- *Arnab Shaw* (937-775-5064, arnab.shaw@wright.edu, 427 Russ Center), Professor Emeritus, Ph.D., University of Rhode Island, 1987. Research interests include: sensor signal and image processing, automatic target recognition, hyperspectral image processing, angles of arrival estimation, LIDAR vibrometry based target recognition, Target Recognition using Deep Neural Networks, Target detection with MIMO Networks.
- *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), 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.
- *Kefu Xue* (937-775-5037, kefu.xue@wright.edu, 313 Russ Center), Associate Professor Emeritus, 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), Professor, Ph.D., University of Cincinnati, 2001. Research interests include: Fault diagnosis and fault-tolerant control, intelligent control, autonomous robots, reinforcement learning & AI, verification and validation of complex control systems.
- *Yan Zhuang* (937-775-4556, yan.zhuang@wright.edu, 421 Russ Center), Professor and Department Chair, 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.

3 M.S.E.E.

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

3.1.2 Requirements

A student may be admitted to the program with **regular** status if they hold a Bachelor of Science in Electrical Engineering or related fields from an ABET-accredited (Washington Accord » International Engineering Alliance) 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 University Center for International Education (UCIE). International students should contact UCIE regarding application deadlines, proof of English proficiency, Learning English for Academic and Professional Purposes (LEAP), financial statements, and other requirements. International students who do not have a degree from a U.S. institution must meet UCIE's English proficiency criteria (Graduate Admission Requirements | International Admissions | Wright State University)

International applicants with a BS degree in EE or related fields from a non-ABET accredited (Washington Accord » International Engineering Alliance) institution will be granted **regular** admission status with a minimum GPA of 2.9 on a 4.0 scale.

.

3.1.4 GRE Requirement

GRE test score is not required for admission to the MSEE 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 via petition at the discretion of the EE Department Student Affairs Committee for exceptional situations.

3.2 MSEE 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 Electrical Engineering include:

1. Submit a Program of Study, conforming to the following requirements, with approval by the Graduate Program Director **by the end of the first semester**.
2. Complete at least 30 graduate credit hours (WSU courses numbered 6000 or above) with the following restrictions:
    a. At least 18 of the 30 graduate credit hours must be EE prefix courses.
    b. At least 18 of the 30 graduate credit hours must be numbered 7000 or above.
    c. At least 12 of the 18 7000 level credit hours must be EE prefix courses.
3. A successfully advised and defended Thesis may count at most 9 graduate credit hours (through “P” grades in EE 7990) toward graduation for **thesis-option** students.
4. At most - 3 credit hours of “Independent Study” (through “P” grades in EE 7900) may be counted toward graduation.
5. At most 12 hours of Graduate-Program-Director-approved graduate transfer credit may be applied toward graduation.
6. Elective graduate courses counting toward graduation must be closely related to EE and approved by the Graduate-Program-Director. Courses that have no graduate-level technical/engineering content will not be considered.
7. No more than 6 graduate credit hours of C grades may be counted toward graduation. Of the maximum total of 6 graduate credit hours of C, no more than 2 of these may correspond to Laboratory courses.
8. A minimum GPA of 3.0 is required for graduation.

VLSI & Electronics	Controls & Robotics	Signal Processing & Communications	RF & Microwave
EE 6440	EE 6120	EE 6000	EE 6100
EE 6540	EE 6130	EE 6210	EE 6400
EE 6550	EE 6170	EE 6360	EE 6420
EE 6620	EE 6190	EE 6730	EE 6460
EE 7410	EE 6560	EE 6750	EE 6470
EE 7420	EE 6600	EE 6840	EE 6480
EE 7430	EE 7020	EE 7010	EE 6700
EE 7440	EE 7030	EE 7150	EE 7080
EE 7510	EE 7200	EE 7160	EE 7430
EE 7520	EE 7260	EE 7170	EE 7440
EE 7530	EE 7270	EE 7330	EE 7460
EE 7540	EE 7280	EE 7350	EE 7470
EE 7550	EE 7560	EE 7360	EE 7480
EE 7580		EE 7370	EE 7490
EE 7590		EE 7400	
EE 7810		EE 7610	
		EE 7620	
		EE 7630	
		EE 7820	
		EE 7830	
		EE 7840	

Note: Students who have received credit, with a grade of C or better, for 6000-level courses in a major-area course lists may use these to satisfy the major-area course requirement.

3.3 Graduation

Each student must submit an application to receive a master's degree. Application forms are found under Wings Express. Specific cutoff dates are published in the semester class schedule. 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.

3.4 Course Numbering

Courses numbered 7000 and above are intended to be taken only by graduate students.

Courses numbered above 6000 are typically co-listed in the undergraduate catalog with a corresponding 4000 number and may be attended by graduate and undergraduate students. Co-listed courses taken at 4000 level as an undergraduate cannot be repeated as a 6000 level course as a graduate student. No course may be used to satisfy the credit-hour requirements of multiple degrees, except for satisfying the combined B.S./M.S. in Electrical Engineering degree program requirements. Graduate students should expect additional requirements when enrolled in a course a course offered to both graduate and undergraduate students.

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 website.

What if I earn poor grades? You may either keep the grade or replace the grade (Course Repeats | policy.wright.edu). 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 12 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.

How may I earn credit for independent study? Up to three 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 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 18 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. Please contact your advisor for a list of approved non-EE courses.

Financial Support

3.6 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.

3.7 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 expected to follow the thesis option for the MSE degree

3.8 Non-University Employment

Students desiring part-time work should contact the College of Computer Science and Engineering Brandeberry Career Development Center at 292 Joshi Research Center. International students must obtain approval for any off-campus co-op/internship work through the University Center for International Education (UCIE).

3.9 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 Center job postings as well as inquire at individual department offices.