MASTER OF ELECTRICAL ENGINEERING
2017-2018 Handbook
This handbook provides general guidelines for ECE M.E.E. students. All degree plans and graduate student matters must conform to the Rice University General Announcements and be approved by the ECE Professional Master’s Committee. In addition, it is the student’s responsibility to become familiar with the contents of this handbook and to comply with all regulations, policies, procedures and deadlines, including the Rice University Honor Code.
I. ABOUT THE M.E.E. IN ECE ................................................. 4
   Honor Code........................................................................ 4

II. ADMINISTRATION/GENERAL INFORMATION .............. 4-7
   Your Department Partners ........................................... 4
   Mail ............................................................................. 5
   ESTHER.......................................................................... 5
   Degree Works............................................................. 5
   Student Health Services ............................................. 5
   Technology Support.................................................... 5
   International Student Information ......................... 6
   Graduate Studies Form Library.................................. 6
   Employment............................................................... 6
   GSA Information......................................................... 6
   ECE GSA........................................................................ 7
   Women ExCEEL............................................................ 7

III. GENERAL ANNOUNCEMENTS ....................................... 7-9

IV. M.E.E. TIMELINE .......................................................... 10
   Semester 1..................................................................... 10
   Semesters 2 & 3........................................................... 10

V. ACADEMICS ..................................................................... 10-15
   M.E.E. Program Information..................................... 10
   M.E.E. Degree Plan................................................... 11
   ELEC 698 Seminar..................................................... 11
   Academic Advisors.................................................... 12
   ECE Areas of Study.................................................. 12
   ESTHER.......................................................................... 14
   Guidelines for Independent Study............................. 14
   Grades and Academic Status................................. 14

VI. IMPORTANT LINKS AND DATES .................................. 16-18
   Links............................................................................. 16
   Dates ........................................................................... 17
   Help Available........................................................... 17

VII. DEPARTMENT DIRECTORY .......................................... 19-26
I. ABOUT THE MASTER OF ELECTRICAL AND COMPUTER ENGINEERING (M.E.E.)

Welcome to the Rice University Department of Electrical and Computer Engineering (ECE)! Your admission to Rice is the latest milestone in an exemplary academic career. At Rice, researchers and faculty members at the forefront of their fields will guide you. You will be taught to think creatively, be a part of a network of knowledge, and redefine your own limits.

The M.E.E. at Rice University is a course-based program; no thesis is required. It is intended to enhance the education of those who have a B.A. or a B.S. in an engineering or science discipline. The Rice M.E.E. program will prepare you to succeed and advance rapidly in today’s competitive technical marketplace, and can be completed on a full or part-time basis.

Honor Code
All incoming Rice students agree to abide by the Rice University honor system. The honor system, one of the oldest and proudest traditions at Rice, is administered by the Honor Council, whose student members are elected each year by the student body. Adopted by a student vote in 1916, the honor system has remained essentially the same since that time but for changes in the procedures and membership of the Honor Council.

Students take all written examinations and complete any specifically designated assignments under the honor system. By committing themselves to the honor system, all students accept responsibility for assuring the integrity of the examinations and assignments conducted under it. More information can be found at ga.rice.edu.

II. ADMINISTRATION

Your Department Partners
ECE graduate students are welcome to ask for assistance when it is needed. ECE administrative staff, Engineering Professional Masters Program (EPMP) staff and the Professional Masters Committee are all available to answer questions. A directory can be found in Section VII.
Mail
ECE graduate student mailboxes can be found in Abercrombie Room A239. FedEx and UPS Packages are received in Abercrombie A204. Our mailing address is: 6100 Main Street, MS 366, Houston, TX 77005.

ESTHER
ESTHER is the web application for students, faculty and staff. Students will use this application to register for classes and retrieve certain data such as grades and account information. Using ESTHER, students can: update contact information; indicate confidentiality preference; register, add and drop courses; access final grades; view holds on accounts, etc. Visit registrar.rice.edu/students/esther_FAQs/ for information about how to use ESTHER.

Degree Works
Degree Works is a degree-auditing tool that assists students in tracking their academic progress toward graduation. Degree Works can be accessed through ESTHER.

Student Health Services
Student Health Insurance: Rice University requires all degree-seeking students to have health insurance. Students electing to enroll in the Rice Student Health Plan may opt to be billed annually or semi-annually. Contact the Student Health Insurance office for enrollment information and payment options at studenthealthinsurance.rice.edu or email studentinsurance@rice.edu. You must complete an insurance waiver form to waive the Rice Insurance Health Plan.

Health Data Form (HDF): All new graduate students are required to submit a properly completed HDF to Student Health. All students under the age of 22 years, regardless of classification, must provide documentation of vaccination against meningococcal disease. See health.rice.edu for more information.

International Student Health Information: All Rice-sponsored F-1 and J-1 international students must enroll in either 1) Aetna (Rice’s Student Health Insurance Plan) or 2) SAS (Rice’s Approved Alternate Health Insurance Plan for Internationals). Visit oiss.rice.edu/studenthealth/ for more information.
Technology Support
From creating websites, paper publication citations, to research collaboration, the department has a plethora of technology resources available, as well as policies users must adhere to. See ece.rice.edu for more information.

International Student Information
International Student Newsletters can be found at oiss.rice.edu/news/ and more information is in Section VI of this handbook.

Graduate Studies Form Library
The Office of Graduate and Postdoctoral Studies (GPS) maintains a very useful library of commonly needed forms for everything from leaves of absence to candidacy petition to thesis submission. Visit graduate.rice.edu/forms for more information.

Specific forms include:

  * Enrollment
    * Leave of Absence
    * Short Term Medical and Parental Leave
    * Withdrawal
  * Degree Conferral
    * Registrar’s Application for Degree
    * Graduation Checklists
  * Commencement

Employment
Students must complete an I-9 form before starting work at Rice. Students working for more than 20 hours per week are not normally eligible for full-time status, and special permission is needed. See the ECE M.E.E. Program Administrator for details.

International students must obtain the appropriate work authorization from OISS before starting to work. If you work even one day before or after your authorization, you must leave the U.S. or face deportation. See oiss.rice.edu/studentwork/ for additional information.

Graduate Student Association (GSA)
The GSA is comprised of degree-seeking graduate students at Rice University. The GSA mission is to enrich the graduate student experience and to represent, support, and promote graduate student interests and values. Visit gsa.rice.edu to learn more.
ECE GSA
The ECE GSA exists to augment the organizational, educational, professional, and social aspects of the graduate student experience. It serves as a connection to Rice’s overall GSA to voice larger concerns and gain supplementary support. Email pratiksha.d.dongare@rice.edu for details.

Women ExCEL
Women Excel is a network of women in the ECE Department at Rice University that aims to provide community, mentoring, and cultural enrichment for students. They furnish a medium for networking and discussion of women-specific issues. This network also serves to promote career opportunities and cultivate female leadership. In addition, they hope to improve the visibility of women in engineering and to advocate the importance of diversity in ECE. Learn more at excel.rice.edu.

III. GENERAL ANNOUNCEMENTS

Rice University publishes its “General Announcements” (GA) each year. These are the official rules of the university and include the honor code that every student agrees to abide by, as well as forms and research information. They can be found at ga.rice.edu. Two sections of the GA are of particular importance to graduate students in ECE. The first is the section titled “Graduate Degree Programs.” This outlines the basic rules and expectations for all graduate students at Rice University. The second, titled “Programs of Study,” is the department-specific information. This information covers the degree requirements for the M.E.E. and more information is found in Section V of this handbook. The ECE M.E.E. requirements from this section are reproduced below.

Graduate Degree Program
The Electrical and Computer Engineering department offers two graduate degree programs. The Master of Electrical Engineering (MEE) degree is a course-based program designed to increase a student’s mastery of advanced subjects; no thesis is required. The MEE prepares a student to succeed and advance rapidly in today’s competitive technical marketplace. Additionally, a coordinated MBA/MEE degree is offered in conjunction with the Jesse H. Jones Graduate School of Business.

Degree Requirements for MEE in Electrical Engineering
The MEE degree is a non-thesis master’s degree. For general university requirements, please see Non-Thesis Master’s Degrees. Students pursuing the MEE degree must
• A minimum of 10 courses (30 credit hours) at the 500-level or higher to satisfy degree requirements.
• 8 of the 10 courses in the major and minor areas of specialization shall be courses taught by ECE faculty. Only exceptions approved by the Chair of the M.E.E. Committee will be permitted.
• A minimum of 6 courses (18 credit hours) from an Area of Specialization.
• A minimum of 2 courses (6 credit hours) from another Area of Specialization (as a minor area).
• A minimum overall GPA of 3.0 in required coursework with a minimum grade of C (2.0 grade points) in each course.
• A maximum of 1 course (3 credit hours) of graduate-level coursework from transfer credit. For additional departmental guidelines regarding transfer credit, see the Policies tab.
• ELEC 698 each semester of full-time enrollment.

Students are admitted to the MEE degree program in the fall semester. MEE students are to consult with an academic advisor on the MEE Committee each semester in order to identify and clearly document their individual curricular requirements or degree plan to be followed. An MEE degree planning form and current requirements may be found on the ECE website.

Areas of Specialization
Students must complete a minimum of 6 courses (18 credit hours) from one area of specialization and a minimum of 2 courses (6 credit hours) from another area of specialization as a minor area. The following courses represent typical courses under the current 5 areas of specialization that students may study as part of the MEE degree program. Students may take and are encouraged to take, with the approval of an academic advisor, other courses that are not listed below that are consistent with their career objectives. ELEC 590 may not be applied toward the requirements for the areas of specialization.

Computer Engineering
ELEC 513/COMP 513 Complexity in Modern Systems [ 3 credit hours ]
ELEC 516 Analog Integrated Circuits [ 3 credit hours ]
ELEC 522 Advanced VLSI Design [ 3 credit hours ]
ELEC 524/COMP 524 Mobile and Wireless Networking [ 3 credit hours ]
ELEC 526/COMP 526 High Performance Computer Architecture [ 3 credit hours ]
ELEC 527 VLSI Systems Design [ 3 credit hours ]
ELEC 553 Mobile and Embedded Systems Design and Application [ 4 credit hours ]
ELEC 554/COMP 554 Computer Systems Architecture [ 4 credit hours ]

Data Science
ELEC 502/COMP 502/STAT 502 Neural Machine Learning I [ 3 credit hours ]
or COMP 540 Statistical Machine Learning [ 4 credit hours ]
ELEC 531 Statistical Signal Processing [ 3 credit hours ]
ELEC 533/CAAM 583/STAT 583 Introduction to Random Processes and Applications [3 credit hours]
ELEC 535 Information Theory [3 credit hours]
ELEC 557/COMP 557 Artificial Intelligence
ELEC 575 Learning from Sensor Data [3 credit hours]
ELEC 576 A Practical Introduction to Machine Learning [3 credit hours]
STAT 613 Statistical Machine Learning [3 credit hours]
ELEC 631 Advanced Topics in Signal Processing [3 credit hours]
STAT 648 Graphical Models and Networks [3 credit hours]

Neuroengineering
ELEC 502/COMP 502/STAT 502 Neural Machine Learning I [3 credit hours]
ELEC 533/CAAM 583/STAT 583 Introduction to Random Processes and Applications [3 credit hours]
ELEC 548/BIOE 548 Machine Learning and Signal Processing for Neuroengineering [3 credit hours]
ELEC 585/BIOE 591 Fundamentals of Medical Imaging I [3 credit hours]
ELEC 588 Theoret. Neuroscience: From Cells to Learning Systems [3 credit hours]
ELEC 589 Neural Computation [3 credit hours]
ELEC 680/BIOE 680 Nano-Neurotechnology [3 credit hours]
NEUR 582 Intro to Computational Neuroscience

Photonics, Electronics, and Nano-Devices
ELEC 562 Optoelectronic Devices [3 credit hours]
ELEC 568 Laser Spectroscopy [3 credit hours]
ELEC 569/PHYS 569 Ultrafast Optical Phenomena [3 credit hours]
ELEC 571 Imaging at the Nanoscale [3 credit hours]
ELEC 603 Topics in Nanophotonics [2 credit hours]
ELEC 605/PHYS 605 Electrodynamics & Nanophotonics [3 credit hours]
ELEC 661/CHEM 661/MSNE 661 Nanophotonics and Sustainability [3 credit hours]

Systems
ELEC 531 Statistical Signal Processing [3 credit hours]
ELEC 533/CAAM 583/STAT 583 Introduction to Random Processes and Applications [3 credit hours]
ELEC 535 Information Theory [3 credit hours]
ELEC 537 Communication Networks [3 credit hours]
ELEC 539 Introduction to Communication Networks [3 credit hours]
ELEC 542 Vector Spaces and DSP [3 credit hours]
ELEC 546 Intro to Computer Vision [3 credit hours]
ELEC 547 Computer Vision [3 credit hours]
ELEC 549 Computational Photography [3 credit hours]
ELEC 551 Digital Communication [3 credit hours]
ELEC 558 Digital Signal Processing [3 credit hours]
IV. M.E.E. TIMELINE

Semester 1
Your first semester at Rice will begin with Orientation Week (or O-Week) where you will learn about Rice and ECE. The major events of this week will include presentations by many of the faculty with whom you will become familiar. You will meet your advisor, discuss your career objectives and select your courses for your first semester. In consultation with your advisor, you will determine a degree plan and timeline for completion. This must be submitted to the Professional Master’s Program Administrator before the start of the second week of classes in the first semester. M.E.E. students are to consult with an academic advisor on the M.E.E. Committee each semester in order to identify and clearly document their individual curricular requirements or degree plan to be followed. A degree plan must be submitted for each semester in residence, but degree plans may be revised, re-approved and resubmitted at any time. An M.E.E. degree planning form and current requirements may be found at ece.rice.edu. See Section V for more information.

Semesters 2 and 3
Students should consult their Degree Works record to evaluate how they are meeting the university and departmental degree requirements. In the final semester of M.E.E. studies, an “Application for Degree” is submitted to the registrar. Visit graduate.rice.edu/forms for the petition. The M.E.E. program must be completed within 5 years.

V. ACADEMICS

M.E.E. Program Information
The M.E.E. is a terminal, non-thesis degree intended primarily for students who wish to strengthen their academic background through three or four semesters of additional coursework. The M.E.E. program is a bridge to industry, designed to provide advanced learning and training in the applied aspects of ECE technology beyond the typical undergraduate electrical and computer engineering degree program.

Upon matriculation, the M.E.E. student selects a faculty advisor in his/her primary area of interest (See “ECE Areas of Study” in this section). The advisor will counsel the student in developing a degree plan consistent with the student’s career objectives.
**Degree Plan**

Coursework is based on the student’s degree plan. The M.E.E. degree plan must include:

- At least 30 credit hours comprised of 10 courses of at least 3 hours each: Major area (18 hours); Minor Area (6 hours); Electives (6 hours)
- All of the 10 required courses must be 500 level or higher
- 8 of the 10 courses in the major and minor areas of specialization shall be courses taught by ECE faculty. Only exceptions approved by the Chair of the M.E.E. Committee will be permitted.
- No ELEC 590 may count for major or minor area
- ELEC 698 for each semester

Electives may be fulfilled through research (ELEC 590), other ECE electives, or through courses available through affiliated departments in areas such as Communication Training or Engineering Leadership Management, including, but not limited to:

- ENGI 505 (3) Engineering Project Management and Economics
- ENGI 510 (3) Technical and Managerial Communications
- ENGI 528 (3) Engineering Economics
- ENGI 529 (3) Ethics and Engineering Leadership
- ENGI 610 (3) Management for Science and Engineering
- ENGI 615 (3) Leadership Coaching for Engineers
- NSCI 511 (3) Science Policy and Ethics

Students may be eligible to transfer up to three hours of course credit from another university. Rice undergraduates entering the M.E.E. program may transfer 500-level course credit not applied to their undergraduate degrees, with the approval of the Professional Masters Committee and Office of the Registrar. See the ECE M.E.E. Administrator for details.

The M.E.E. may be pursued on a part-time or full-time basis. A 3.0 GPA must be maintained in major and minor coursework. Only courses in which a grade of C or above is achieved will be counted towards the M.E.E. degree. Students whose GPA falls below a 2.33 will be placed on academic probation by the university. Students whose GPA falls below a 3.0 will be placed on academic probation by the ECE Department. Students must maintain continuous program enrollment and involvement unless granted an official leave of absence. For more information see the GA: [ga.rice.edu](http://ga.rice.edu).

**ELEC 698 Seminar**

The ELEC 698 Seminar course broadens M.E.E. students’ exposure
to activities and opportunities in all fields of electrical engineering, both in industry and research settings. All M.E.E. students are required to take and successfully complete ELEC 698 for each semester in residence. The course requires registered attendance at 3 ECE sponsored or co-sponsored seminars per semester, and at the featured departmental events described in the following paragraph. Details of seminars are emailed and posted on the ECE website at ece.rice.edu. Some seminars hosted by the Engineering Professional Master’s Program (EPMP) can count for 1 of the 3 seminars. Please check with the M.E.E. Administrator for a list of approved seminars. Students are responsible for signing in during the first 10 minutes of the seminar. Attendance logged after that time will not be counted. If there are any difficulties with signing in, students should contact the M.E.E. Administrator within 24 hours of the seminar.

In addition to attendance at 3 seminars, ELEC 698 requires that each student attend and sign-in for the following events: ECE Corporate Affiliates Day, the Brice Distinguished Lecture, and the Chapman Distinguished Lecture, in the years they are held. These featured departmental events provide each M.E.E. student excellent opportunities to expand his/her professional network by interacting with alumni and industrial affiliates of the ECE department. **Corporate Affiliates Day is scheduled for March 23, 2018 and attendance is required.** Exceptions must be approved and signed off by the M.E.E. Administrator. Reasonable exceptions include work obligations, travel for job interviews, etc.

**Academic Advisors**
Each incoming M.E.E. student selects an academic advisor, usually a member of the Professional Master’s Committee, to help with course selection and other initial academic concerns. Final course selection does not need to be completed until after the start of classes, but must be completed before the Add deadline, typically the Friday of the second week of classes.

**ECE Areas of Study**
The ECE Department has five interdisciplinary areas of study that the M.E.E. student can choose from:

*Computer Engineering:*
The Computer Engineering group at Rice University has a long track record
of innovative research in physical modeling and characterization, VLSI signal processing, computer architecture, computer-aided design, and storage and network systems. Spanning the spectrum of computing from low-power personal devices to large-scale parallel information systems, networked computing solves a myriad of technology challenges. Future computing technologies include the on-chip integration of systems and networks.

**Data Science:**
Data scientists seek to collect and understand the structure in data, looking for compelling patterns, telling the story that is buried in the data. They get at the questions at the heart of complex problems and devise creative approaches to making progress in a wide variety of application domains. This is an emerging discipline that integrates: tools and techniques involving data acquisition; data analytics and data storage; and computing infrastructure in order to enable extraction of meaningful information from massive data sources.

**Neuroengineering:**
The brain is essentially a circuit. Neuroengineering is a discipline that exploits engineering techniques to understand, repair and manipulate human neural systems and networks. At Rice, we develop technologies to understand, repair, replace, enhance, or treat the diseases of the nervous system. We also design, construct and study devices that interface with living neural tissue. Rice is uniquely positioned as a leader in the field thanks to the broad, interdisciplinary research performed in conjunction with the world's largest medical center (Texas Medical Center), steps away from the Rice University campus.

**Photonics, Electronics and Nano-devices (PEN):**
The focus of this program is the improved understanding of electronic, photonic, and plasmonic materials, optical physics, the interaction of light and matter, along with the application of that knowledge to develop innovative devices and technologies. The specific areas of interest cover a broad range, including: nanophotonics and plasmonics; studies of nanomaterials and magnetically active materials; imaging and image processing, including multispectral imaging and terahertz imaging; ultrafast spectroscopy and dynamics; laser applications in remote and point sensing; single-molecule transistors; and applications of Nanoshells in biomedicine.

**Systems:**
Rice is a leader in Digital Signal Processing. Signal Processing is the analysis and transformation of signals in order to understand, simplify, or recast their structure. The understanding of how to analyze and restructure signals is applied to a wide range of areas, including: image and video analysis; computational neuroscience; statistical signal processing, pattern recognition,
and learning theory; communication systems; and high-performance, scalable wireless internet.

**ESTHER**

Students must register for courses using ESTHER which is the web application for students, faculty and staff. Students will use this application to register for classes and retrieve certain data such as grades and account information. For information about how to use ESTHER see Section II or: registrar.rice.edu/students/esther_FAQs/

**Guidelines for Independent Study**

ELEC 590 - Graduate Non-Thesis Research Projects is intended for M.E.E. students who wish to undertake specific research projects under the direction of a faculty member. The parameters of the research project and grade determination should be discussed with the faculty member prior to enrollment. A brief abstract describing the proposed research should be approved by the faculty advisor and submitted to the faculty advisor and M.E.E. Program Administrator before registering for the course. The form may be found at ece.rice.edu. A maximum of 3 credits of ELEC 590 can be applied to the M.E.E. degree as an elective course.

ELEC 591 - Vertically Integrated Projects at Rice University (VIP)

The (VIP) Program at Rice unites graduate and undergraduate education and faculty research in a team-based context. Students interested in VIP projects should meet and consult with the faculty lead of that project. Visit vip.rice.edu for more information.

**Grades and Academic Status**

*Grades*—According to university guidelines, students must achieve at least a B- (2.67) grade point average (GPA) both in courses counted toward the graduate degree as well as the cumulative GPA. A 3.0 GPA must be maintained in major and minor coursework. The ECE Department adds the requirement that only courses in which a grade of C or above was earned will count towards the graduate degree. Students whose cumulative GPA falls below a 2.67, or whose semester GPA falls below a 2.33, will be placed on academic probation by the university. **Students whose GPA falls below a 3.0 will be placed on academic probation by the ECE Department.** To compute GPA, the credits attempted in semester hours for each course and the points for the grade earned (from A+ = 4.33 to F = 0.00) are multiplied, then
the products (one for each course) are added together, and the sum is divided by the total credits attempted.

Pass/Fail—For the M.E.E. degree, elective courses taken outside the ECE department that do not count toward the student's major or minor coursework may be taken Pass/Fail. Students must file a course as Pass/Fail no later than the end of the 10th week of classes; however, they may later convert a Pass/Fail to a graded course by filing the appropriate paperwork with the Office of the Registrar by the end of the second week of the following semester. Students should be aware that while a grade of “P” does not affect their GPA, a grade of “F” does.

Satisfactory/Unsatisfactory—In the ECE Department, the faculty may assign a grade of “S” or “U”. ELEC 698, ECE Professional Masters Seminar Series, is such a course. Students should be aware that while a grade of S or U does not affect their GPA, no credit is awarded if a grade of U is received. Courses with a grade of S will count towards total credits earned.

Incomplete (INC)—For an INC received in the fall semester, students must complete the work by the end of the first week of the spring semester or an earlier date as defined by the instructor, and instructors must submit a revised grade by the end of the second week. For an INC received in the spring or summer semester, students must complete the work before the start of the fall semester or an earlier date as defined by the instructor, and instructors must submit a revised grade by the end of the first week. If a grade is not submitted by the appropriate deadline, the INC will be automatically converted to a failing grade.

Audit (AUD)—The grade designation of “AUD” is used for people auditing a course, and specifically when the auditing student has met the audit requirements of the course. A grade designation of “NC” (no credit) is given to students who do not meet the audit requirements. Requests to audit a class or to change from audit to credit or vice versa must be done by the end of the second week of the semester.
VI. IMPORTANT LINKS AND DATES

Links
Academic Calendar: registrar.rice.edu
Award Opportunities: engineering.rice.edu/gradopps
Counseling Center: wellbeing/rice.edu/rice-counseling-center
Course Catalog: courses.rice.edu
Forms: registrar.rice.edu/online_forms
graduate.rice.edu/forms
General Announcements: ga.rice.edu
Good Practices in Graduate Education: graduate.rice.edu/goodpractices
Graduate and Postdoctoral Studies (GPS) Office: graduate.rice.edu
Guidelines for Dismissal/Petition: bit.ly/RUdismiss
Honor System and Code of Student Conduct: ga.rice.edu
International Student Information: oiss.rice.edu
International Student Forms: oiss.rice.edu/forms/
Library: library.rice.edu
Map of Campus: rice.edu/maps
Parking: parking.rice.edu
Recreation Center: recreation.rice.edu
Registration: graduate.rice.edu/registration
Research and Scholarly Activities: ga.rice.edu/GR_students/
Technology Support: ece.rice.edu
Wellness: wellbeing.rice.edu
Dates
Refer to the Rice Registrar’s Office at registrar.rice.edu for all academic calendar information.

Help Available
When you or a friend is in need of help, there are many resources available to you on the Rice campus:

**Professional Masters Committee Chair & Administrator**
Dr. Michael Orchard, Professional Masters Committee Chair, and Norma Santamaría, M.E.E. Program Administrator, are available to help students with academic and personal needs. Their contact information can be found in Section VII.

**Student Health Services:** health.rice.edu
The Rice Student Health Services provides preventive and outpatient clinical care for the students of Rice University. Student Health is located on-campus and is dedicated to meeting the unique needs of undergraduate and graduate students.

**Student Wellbeing Office:** wellbeing.rice.edu
The Student Wellbeing Office supports student development and success and is also a good first point of contact for students who want to talk to someone about solutions to their wellbeing concerns. The office can provide advice and practical support to help you resolve personal challenges, such as conflicts with friends, difficulty making decisions, struggling with your identity, and academic or other concerns.

**Rice Counseling Center:** wellbeing.rice.edu/rice-counseling-center
The Rice Counseling Center is designed to complement the university’s academic mission by assisting students’ personal and educational development through a variety of psychological and psychiatric services. The goal of these efforts is to help students develop effective problem-solving and decision-making capabilities in order to make satisfying life choices, and maximize their capacity for continued emotional growth.

**Language and Communications:** cwovc.rice.edu
The Center for Written, Oral and Visual Communication is located in the Fondren Library. They offer coaching for oral presentation
delivery, videotaping, assistance with preparing professional talks and materials, communication workshops and feedback on presentation materials. They also offer UNIV 601/602, which are courses designed to improve professional communication and writing.

Graduate and Postdoctoral Studies (GPS) office: gps.rice.edu
For questions concerning the graduate program as a whole, contact Sherry Vanderslice, Graduate Student Affairs Project Manager, at sdvl@rice.edu or 713-348-2154.

Title IX Information safe.rice.edu
Rice encourages any student who has experienced an incident of sexual, relationship, or other interpersonal violence, harassment or gender discrimination to seek support. There are many options available both on and off campus for all graduate students, regardless of whether the perpetrator was a fellow student, a staff or faculty member, or someone not affiliated with the university.

Students should be aware when seeking support on campus that most employees are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs.

The therapists at the Rice Counseling Center and the doctors at Student Health Services are “confidential,” meaning that Rice will not be informed about the incident if a student discloses to one of these Rice staff members. Rice prioritizes student privacy and safety, and only shares disclosed information on a need-to-know basis.

If you are in need of assistance or simply would like to talk to someone, please call Rice Wellbeing and Counseling Center, which includes Title IX Support, at extension 3311 on the Rice campus or (713) 348-3311. Policies, including Sexual Misconduct Policy and Student Code of Conduct, and more information regarding Title IX can be found at safe.rice.edu.

IEEE Student Chapter ieee.rice.edu
The undergraduate chapter of Rice Institute of Electrical and Electronics Engineers (IEEE) offers lunch talks from industry visitors. All are welcome to attend.
VII. DEPARTMENT DIRECTORY

STAFF DIRECTORY

Norma Santamaría  
M.E.E. Program Administrator  
Undergraduate Program Administrator  
713-348-6722  
ns37@rice.edu  
Abercrombie B203

Trey Menchaca  
Staff Assistant  
713-348-4020  
am22@rice.edu  
Abercrombie A204

Carrie Toffoletto  
Executive Administrator  
713-348-5081  
ctoffo@rice.edu  
Abercrombie A204

Jennifer Hunter  
Visibility Specialist  
713-348-4212  
jkh6@rice.edu  
Abercrombie A203

Additional information such as a full listing of all staff and their responsibilities can be found at ece.rice.edu.
Behnam Aazhang*, J.S. Abercrombie Professor, Electrical and Computer Engineering
aaz@rice.edu
Research areas: Data Science; Neuroengineering; Systems
Dr. Aazhang researches neural circuits in the hopes of mitigating disorders such as epilepsy, parkinson, depression and obesity. Other areas of study include communication and information theory. REU opportunities available.

Athanasios C. Antoulas, Professor, Electrical and Computer Engineering
aca@rice.edu
Research areas: Computer Engineering; Systems
Dr. Antoulas is interested in large-scale dynamical systems, approximation, computation, and linear algebra.

Aydin Babakhani, Associate Professor, Electrical and Computer Engineering
ab28@rice.edu
Research areas: Computer Engineering; Neuroengineering; Systems
Dr. Babakhani's research focuses on integrated sensors and systems and his work impacts high-speed wireless, radar, medical imaging, security, biosensing, and oil/gas monitoring.

Richard G. Baraniuk, Victor E. Cameron Professor of Electrical and Computer Engineering
richb@rice.edu
Research areas: Data Science; Neuroengineering; Systems
Dr. Baraniuk is the founder of OpenStax, providing free college textbooks! He is interested in multiscale, computational signal and image processing and open access, collaborative scholarly publication.

Palash Bharadwaj, Assistant Professor, Electrical and Computer Engineering
palash.bharadwaj@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Bharadwaj is interested in light-matter interaction at the nanoscale, optical antennas, nanoscale energy transduction, plasmonics, spectroscopy and microscopy, and optoelectronics.

Joseph R. Cavallaro*, Professor, Electrical and Computer Engineering & Computer Science
cavallar@rice.edu
Research areas: Computer Engineering; Systems
Dr. Cavallaro's research impacts the development of the next generation of cellular mobile phones. He studies Wireless Communication Systems Architectures, VLSI Systems Design and Prototyping. REU opportunities available.

*Denotes VIP Faculty

ECE is Epilepsy Research

Epilepsy is the 4th most common neurological disease in United States, and many patients don’t respond well to traditional treatment like drugs. The Aazhang group is working to predict the onset of seizure.
ECE is Solar Desalination

Rice’s Center for Nanotechnology Enabled Water Treatment (NEWT) has developed an off-grid technology that uses energy from sunlight alone to turn salt water into fresh drinking water.

ECE Professor Naomi Halas leads NEWT’s nanophotonics research efforts.

Gene Frantz, Professor in the Practice, Electrical & Computer Engineering (Signal Processing)
genef@rice.edu
Research areas: Systems
Gene Frantz is interested in entrepreneurship and intrepreneurship. He is an expert in Digital Signal Processing.

Fabrizio Gabbiani, Professor, Electrical & Computer Engineering
Professor of Neuroscience, Baylor College of Medicine
gabbiani@bcm.edu
Research areas: Neuroengineering
Dr. Gabbiani is interested in computational aspects of sensory information processing from the single cell to the network level.

Naomi J. Halas, Stanley C. Moore Professor, Electrical & Computer Engineering
Professor of Biomedical Engineering, Chemistry, Physics and Astronomy
halas@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Halas’ group harvests solar radiation for energy applications and researches nanoparticle use in cancer therapy. She designs and fabricates optically responsive nano structures, nanophonotics, and plasmonics.

Reinhard Heckel, Assistant Professor, Electrical and Computer Engineering
(Anticipated Fall 2017 - check ece.rice.edu)
Research areas: Data Science; Systems
Dr. Heckel is interested in signal processing, statistics, and machine learning with a focus on developing algorithms and theory for space signal recovery, clustering of high-dimensional statistics, and convex optimization.
Edward W. Knightly, Chair, Electrical and Computer Engineering, Lindsay-Sheafor Professor, Electrical and Computer Engineering, Professor, Computer Science
knightly@rice.edu
Research areas: Systems
Dr. Knightly is the founder of Technology for All, bringing tech to underserved areas. He is interested in wireless networks, urban-scale testbeds, clean-slate design, diverse spectrum access, multi-antenna systems, hardware platforms, high-performance protocol design, security, & performance evaluation. REU opportunities available.

Junichiro Kono, Professor, Electrical and Computer Engineering, Physics & Astronomy
kono@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Kono's research results in increased understanding of quantum states. He's interested in condensed matter physics, optics and photonics, nanoscience and nanotechnology. REU opportunities available.

Yingyan Lin, Texas Instruments Visiting Assistant Professor, Electrical & Computer Engineering (anticipated Fall 2017 - check ece.rice.edu)
Research areas: Computer Engineering; Data Science
Dr. Lin's research interests include analog and mixed-signal circuits, error resiliency techniques, and VLSI circuits and architectures for machine learning systems on resource-constrained platforms. REU opportunities available.

Kevin Kelly, Associate Professor, Electrical and Computer Engineering**
kkelly@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Kelly is interested in imaging and spectroscopy at the nanoscale, and understanding the role of mathematics in image acquisition and interpretation. Other interests include Scanning Probe Microscopy, Electronic Materials, Compressive Infrared and Hyperspectral Imaging.

Caleb Kemere, Assistant Professor, Electrical and Computer Engineering***
caleb.kemere@rice.edu
Research areas: Neuroengineering
Dr. Kemere is researching memory manipulation for the greater good (treating PTSD) and Deep Brain Stimulation for treatment of diseases like Parkinson. He is interested in building interfaces with memory and cognitive processes; model-based signal processing; and low-power embedded systems.

ECE is Engineering the Brain
The Kemere lab designs systems to interact with complex neural circuits to explore how information is processed, stored and retrieved in both healthy brains and those with disorders, focusing on memory and Deep Brain Stimulation.

**Sabbatical Spring 2018   /   ***Sabbatical Fall 2017
ECE is Research in Education

The Baraniuk lab researches how the brain perceives depth and 3D vision. They are interested in machine learning and image and neural information processing.

Gururaj Naik, Assistant Professor, Electrical & Computer Engineering
guru@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Naik is interested in light and heat management for clean energy: thermovoltaics and photovoltaics; materials for plasmonics and metamaterials; and large-area nanofabrication and integration. REU opportunities available.

Michael T. Orchard, Professor, Electrical & Computer Engineering
orchard@rice.edu
Research areas: Data Science; Systems
Dr. Orchard researches image and video modeling and compression.

Ankit Patel, Assistant Professor, Electrical & Computer Engineering
Assistant Professor, Neuroscience, Baylor College of Medicine
abp4@rice.edu
Research areas: Data Science; Neuroengineering; Systems
Dr. Patel is interested in probabilistic theories of Deep Learning from first principles; neurally-inspired learning and computation; medical imaging diagnosis; reverse-engineering neocortex; and Deep Learning for particle physics.

ECE is ‘Upconverted’ Light

Guru Naik’s method to ‘upconvert’ light could make solar cells more efficient and disease-targeting nanoparticles more effective.
Xaq Pitkow, Assistant Professor, Electrical and Computer Engineering  
Assistant Professor, Computational Neuroscience, Baylor College of Medicine  
xaq.pitkow@rice.edu  
Research areas: Data Science; Neuroengineering  
Dr. Pitkow’s research includes theories of neural computation in animal brains. Topics include: probabilistic inference, control theory, nonlinear dynamics, population codes. Current projects include analyzing behaviors of animals playing video games; designing animal virtual reality environments; stimulating and analyzing computation in neural networks.

Jacob T. Robinson*, Assistant Professor, Electrical and Computer Engineering & Bioengineering  
jacob.t.robinson@rice.edu  
Research areas: Data Science; Neuroengineering; Photonics, Electronics & Nanodevices  
Dr. Robinson uses nanotechnology to interact with the brain and to treat neurological disorders. In other words, he uses nanotechnology to measure and manipulate neural activity. **REU opportunities available.**

Akane Sano, Assistant Professor, Electrical and Computer Engineering  
(Anticipated July 1, 2018 - check ece.rice.edu)  
Research areas: Data Science; Systems  
Dr. Sano is interested in affective computing, particularly mobile and personalized health. Currently, she is lead investigator on the SNAPSHOT study measuring sleep, stress, and ambulation in everyday living.

Ashutosh Sabharwal*, Professor, Electrical and Computer Engineering  
ashu@rice.edu  
Research areas: Data Science; Systems  
Dr. Sabharwal is interested in mobile health - using smart devices to diagnose and treat patients in more scenarios, to measure medicine adherence, and to impact health behaviors. He's also interested in wireless networks, information theory, multiple antenna systems, coding and computation.

Harel Shouval, Professor, Electrical and Computer Engineering  
Professor, Neuroscience, UT Health  
harel.shouval@uth.tmc.edu  
Research areas: Neuroengineering  
Dr. Shouval is interested in forming an integrated picture of learning, memory and development, processes that share many common mechanisms.

*Denotes VIP Faculty

---

**ECE is Mobile Health**

In partnership with IBM, ECE researchers have developed a prototype Multi-Purpose Eldercare Robot Assistant (MERA). The Watson-enabled robot is designed to help assist the elderly and their caregivers in an “aging in place” environment.
ECE is Lensless Cameras

ECE Researchers have developed a flexible, lensless camera, smaller than a dime. It’s called “FlatCam”.

Ray Simar*, Professor in the Practice, Electrical and Computer Engineering (Digital Signal Processing Architecture)
ray.simar@rice.edu
Research areas: Systems
Dr. Simar’s team has built a putter that gives active feedback to golfers. They’re now working on a self-driving motorcycle. His research includes digital signal processors, design methodology and programming tools.

Isabell Thomann, Assistant Professor, Electrical and Computer Engineering
it6@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Thomann creates novel materials and nanostructures to solve practical problems in the areas of energy and photocatalysis. She is interested in interdisciplinary problems in energy, photocatalysis, ultrafast spectroscopy and nanophotonics.

Frank K. Tittel, J.S. Abercrombie Professor, Electrical and Computer Engineering, Professor, Bioengineering
fkt@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Tittel’s research includes developing sensor technology for the oil & gas industry. He is interested in quantum electronic devices, laser spectroscopy with applications in environmental monitoring, atmospheric chemistry, industrial process analysis and control, medical diagnostics based on breath analysis, the life sciences, defense applications and homeland security.

Peter J. Varman, Professor, Electrical and Computer Engineering & Computer Science
pjv@rice.edu
Research areas: Computer Engineering; Data Science
Dr. Varman researches computer systems, storage and memory systems, virtualization and resource management, and cloud computing. REU opportunities available.

Ashok Veeraraghavan, Associate Professor, Electrical and Computer Engineering
vashok@rice.edu
Research areas: Data Science; Neuroengineering; Systems
In addition to his recent development of a lensless camera, Dr. Veeraraghavan has a strong interest in mobile health and using smart devices to diagnose and treat patients. He is interested in computational imaging, compressive sensing for imaging, signal processing and computer vision.
Kaiyuan Yang, Assistant Professor, Electrical and Computer Engineering
kyang@rice.edu
Research areas: Computer Engineering
Dr. Yang's research focuses on designing low-power digital and mixed-signal circuits for future secure and low-power applications, especially the Internet of Things (IoT). He is also interested in hardware security and circuit/system design with emerging devices.

Gary Woods*, Professor in the Practice, Electrical and Computer Engineering (Computer Technology)
gary.woods@rice.edu
Research areas: Photonics, Electronics & Nanodevices
Dr. Woods is interested in mobile health, semiconductor failure analysis, and optical probing and debugging of advanced integrated circuits. He has advised groups who’ve gone on to: develop a vest to help the deaf hear; develop a dynamic radar and digital imaging system; and create an automated monitoring and control system for water waste reduction in oil fields.

Lin Zhong, Professor, Electrical and Computer Engineering
lzhong@rice.edu
Research areas: Computer Engineering; Data Science
Dr. Zhong's team recently developed RIO, which allows an application on one mobile system to utilize I/O from another. He’s interested in mobile and embedded systems, human-computer interaction, and nanoelectronics. REU opportunities available.

ECE is RockStar Faculty (really).
Lin Zhong is an actual ECE RockStar - he won the 2014 SIGMOBILE RockStar Award. His group recently developed RIO - a system solution for sharing I/O between multiple mobile devices.
Connect:

facebook.com/RiceECE
@RiceU_ECE
bit.ly/RiceECEin
ece.rice.edu