Department of Electrical and Computer Engineering

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www.ece.cmu.edu (http://www.ece.cmu.edu)

The field of electrical and computer engineering encompasses a remarkably diverse and fertile set of technological areas, including analog and digital electronics, computer architecture, computer-aided design and manufacturing of VLSI/ULSI circuits, intelligent robotic systems, computer-based control systems, telecommunications and computer networking, wireless communication systems, signal and information processing and multimedia systems, solid state physics and devices, microelectromechanical systems (MEMS), electromagnetic and electromechanical systems, data storage systems, embedded systems, distributed computing, mobile computing, real-time software, digital signal processing, and optical data processing. The extraordinary advances in the field during the last fifty years have impacted nearly every aspect of human activity. These advances have resulted not only in advanced computer systems but also in consumer products such as "smart" cars, programmable dishwashers and other home appliances, cell phones and mobile computing systems, video games, home security systems, advanced medical systems for imaging, diagnosis, testing and monitoring. Systems and products such as these serve to enhance our quality of life and have also served as the basis for significant economic activity. In short, the field of electrical and computer engineering has become central to society as we know it.

The Department of Electrical and Computer Engineering at Carnegie Mellon is actively engaged in education and research at the forefront of these new technologies. Because of the diverse and broad nature of the field and the significant growth in knowledge in each of its sub areas, it is no longer possible for any single individual to know all aspects of electrical and computer engineering. Nevertheless, it is important that all electrical and computer engineers have a solid knowledge of the fundamentals with sufficient depth and breadth. Society is placing increasing demands on our graduates to try their skills in new contexts. It is also placing increasing value on engineers who can cross traditional boundaries between disciplines, and who can intelligently evaluate the broader consequences of their actions. Our curriculum is designed to produce world-class engineers who can meet these challenges.

Educational Outcomes and Objectives

The B.S. in Electrical and Computer Engineering is a broad and highly flexible degree program structured to provide students with the smallest set of constraints consistent with a rich and comprehensive view of the profession. It is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. Students are encouraged and stimulated to explore multiple areas of theory and application. The Faculty of Electrical and Computer Engineering have adopted the following outcomes from ABET and have established the following objectives for the B.S. in Electrical and Computer Engineering curriculum:

ECE Education Objectives

The ECE program objectives are shown below. They represent our vision for what our students will be doing in their engineering careers five years after they have graduated. The principal behaviors we seek to foster in our students are expertise, innovation and leadership. Our graduates will be:

Experts
- They will solve problems by applying ECE fundamentals
- Their solutions will reflect depth of understanding in their sophistication.
- Their solutions will reflect breadth of understanding by drawing on multiple disciplines.

Innovators
- They will demonstrate creativity in their engineering practice.
- They will consider holistic systems-oriented approaches in their designs.
- They will think strategically in their planning and execution.

Leaders
- They will take initiative, and demonstrate resourcefulness.
- They will collaborate in multidisciplinary teams.
- They will be leaders in their organizations, their profession and in society.

An ability to apply knowledge of mathematics, science and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability.
4. An ability to function in multi-disciplinary teams.
5. An ability to identify, formulate and solve engineering problems.
6. An understanding of professional and ethical responsibilities.
7. An ability to communicate effectively.
8. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning.
10. A knowledge of contemporary issues.
11. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Three dimensions of objectives for our graduates.
Curriculum Overview

In addition to the Carnegie Institute of Technology general education (http://coursecatalog.web.cmu.edu/carnegieinstituteoftechnology/#generaleducationcontext) and First Year requirements (http://coursecatalog.web.cmu.edu/carnegieinstituteoftechnology/#firstyearforengineeringstudentcontext) (143 units), the B.S. in Electrical and Computer Engineering requires: 15-122 Principles of Imperative Computation (10 units), Physics II (12 units), two math or science electives (18 units), a Probability and Statistics course (9 units), 109 units of Electrical and Computer Engineering coursework, and 2 math co-requisites (22 units). The remaining units needed to reach the 379 required to graduate are Free Electives (56 units).

The Electrical and Computer Engineering coursework is divided into the categories of Core, Area Courses, Coverage, and Capstone Design. The Core consists of five courses (18-100 Introduction to Electrical and Computer Engineering, 18-220 Electronic Devices and Analog Circuits, 18-240 Structure and Design of Digital Systems, 18-290 Signals and Systems). There are additional co-requisites: 18-202 Mathematical Foundations of Electrical Engineering, 21-127 Concepts of Mathematics and 33-142 Physics II for Engineering and Physics Students, that are required to be taken with the core. These courses provide the fundamental knowledge-base upon which all other electrical and computer engineering courses are built.

Students generally take 18-100 Introduction to Electrical and Computer Engineering during their first year, while they start the remaining courses in the Core in their sophomore year, ideally completing them by the end of the junior year. It is recommended that students do not take more than two core courses in the same semester. Although the core courses (and their co-requisites) may be taken in any order, students generally first take the course in their primary area of interest, which gives added flexibility to later course selection in related areas.

Students are required to complete a seminar course during the fall semester of the sophomore year. This course, 18-200 ECE Sophomore Seminar, introduces students to the many areas within ECE and helps them decide which areas are of primary interest to them.

To satisfy the ECE Area Courses Requirement (http://www.ece.cmu.edu/programs-admissions/bachelors/academic-guide/#collapse-4), at least two Area courses must be completed from one of the following five principal areas in ECE (24 units):

- **Device Sciences and Nanofabrication**: Solid State Physics, Electromagnetic Fields and Waves, Magnetics, Optics, etc.;
- **Signals and Systems**: Digital Signal Processing, Communication Systems, Control Systems, etc.;
- **Circuits**: Analog and Digital Circuits, Integrated Circuit Design, etc.;
- **Computer Hardware**: Logic Design, Computer Architecture, Networks, etc.; and
- **Computer Software**: Programming, Data Structures, Compilers, Operating Systems, etc.

One additional course from a second area must be taken (12 units)

The Coverage requirement is satisfied by taking any additional ECE course(s) or an approved Computer Science course (see the ECE website (http://www.ece.cmu.edu/programs-admissions/bachelors/academic-guide/#collapse-5) for the list of approved coverage courses) totaling at least 12 units.

All students are required to take a Capstone Design course. The Capstone Design course is a senior-level project course (numbered 18-5XX) in which students participate in a semester-long design experience on a team with other students. Students learn project management skills, create oral presentations, write reports, and discuss the broader social and ethical dimensions of ECE. At the completion of the course students will conclude with a demonstration of their product and will be able to explain the design process. Current Capstone Design courses are listed on the ECE Department website (http://www.ece.cmu.edu/programs-admissions/bachelors/academic-guide/#collapse-6).

B.S. Curriculum

Minimum units required for B.S. in Electrical and Computer Engineering 379

For detailed information and regulations of the curriculum along with the degree requirements and the most recent version of the ECE curriculum and course descriptions, please refer to the ECE Academic Guide (http://www.ece.cmu.edu/programs-admissions/bachelors/academic-guide/).

University Requirements

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>99-101</td>
<td>Computing @ Carnegie Mellon</td>
<td>3</td>
</tr>
</tbody>
</table>

CIT Requirements (see CIT section of the catalog for specifics (http://coursecatalog.web.cmu.edu/carnegieinstituteoftechnology/)):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two semesters of calculus</td>
<td>Two semester calculus course</td>
<td>20</td>
</tr>
<tr>
<td>33-141</td>
<td>Physics I for Engineering Students **</td>
<td>12</td>
</tr>
<tr>
<td>or 33-131</td>
<td>Matter and Interaction I</td>
<td>12</td>
</tr>
<tr>
<td>** 33-141/33-142**</td>
<td>is the recommended course sequence, although 33-131/33-132 will also satisfy this requirement.</td>
<td></td>
</tr>
</tbody>
</table>

Specific ECE requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-100</td>
<td>Introduction to Electrical and Computer Engineering</td>
<td>12</td>
</tr>
<tr>
<td>18-200</td>
<td>ECE Sophomore Seminar</td>
<td>1</td>
</tr>
<tr>
<td>18-220</td>
<td>Electronic Devices and Analog Circuits</td>
<td>12</td>
</tr>
<tr>
<td>18-240</td>
<td>Structure and Design of Digital Systems</td>
<td>12</td>
</tr>
<tr>
<td>18-290</td>
<td>Signals and Systems</td>
<td>12</td>
</tr>
<tr>
<td>18-290</td>
<td>Mathematical Foundations of Electrical Engineering</td>
<td>12</td>
</tr>
<tr>
<td>18-213</td>
<td>Introduction to Computer Systems</td>
<td>12</td>
</tr>
<tr>
<td>21-127</td>
<td>Concepts of Mathematics</td>
<td>12</td>
</tr>
<tr>
<td>33-142</td>
<td>Physics II for Engineering and Physics Students</td>
<td>12</td>
</tr>
<tr>
<td>33-142</td>
<td>(co-require for 18-220)</td>
<td></td>
</tr>
<tr>
<td>18-202</td>
<td>Mathematical Foundations of Electrical Engineering</td>
<td>12</td>
</tr>
<tr>
<td>18-240</td>
<td>Structure and Design of Digital Systems</td>
<td>12</td>
</tr>
<tr>
<td>18-213</td>
<td>Introduction to Computer Systems</td>
<td>12</td>
</tr>
<tr>
<td>21-127</td>
<td>Concepts of Mathematics</td>
<td>12</td>
</tr>
</tbody>
</table>

Other ECE Requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-112</td>
<td>Fundamentals of Programming and Computer Science</td>
<td>12</td>
</tr>
<tr>
<td>15-122</td>
<td>Principles of Imperative Computation</td>
<td>10</td>
</tr>
<tr>
<td>36-217</td>
<td>Probability Theory and Random Processes</td>
<td>12</td>
</tr>
<tr>
<td>or 36-225</td>
<td>Introduction to Probability Theory</td>
<td>9</td>
</tr>
<tr>
<td>Free Electives</td>
<td></td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>105</td>
</tr>
</tbody>
</table>

Math/Science Electives

The Math/Science electives are satisfied with any course from The Mellon College of Science or The Department of Statistics and Data Science except for: 100-level courses in Mathematics or Statistics, and courses designed for non-science or engineering majors, such as (but not limited to) 03-132, 09-103, 09-108, 21-240, 21-257, 33-115, 33-124, 36-201, 36-202, 36-207 or 36-208. Although shown in the Junior and year, these courses may be taken at any time. Mathematics courses of particular interest to students in ECE area:
21-228 Discrete Mathematics 9
21-241 Matrices and Linear Transformations 10
21-259 Calculus in Three Dimensions 9
21-260 Differential Equations 9

Free Electives 56 units

A Free Elective is defined as any graded course offered by any academic unit of the university (including research institutes such as the Robotics Institute (http://www.ri.cmu.edu/) and the Software Engineering Institute (http://www.sei.cmu.edu/)). A total of at least 56 units of Free Electives must be taken.

Up to 9 units of Student Taught Courses (StuCO) and Physical Education courses, or other courses taken as Pass/Fail, may also be used toward Free Electives.

Sample Curriculum

The following table shows a possible roadmap through our broad and flexible curriculum:

18-100 Introduction to Electrical and Computer Engineering
15-112 Fundamentals of Programming and Computer Science
21-120 Differential and Integral Calculus
76-101 Interpretation and Argument
99-101 Computing @ Carnegie Mellon

Fall Junior
18-100 Intro to Electrical and Computer Engineering
15-112 Fundamentals of Programming and Computer Science
21-120 Differential and Integral Calculus
76-101 Interpretation and Argument
99-101 Computing @ Carnegie Mellon

Spring Freshman
Introductory Engineering course
ECE Core course
Mathematical Foundations of Electrical Engineering
General Education course
General Education course

Fall Sophomore
18-200 ECE Sophomore Seminar
18-2xx ECE Core course
18-202 Mathematical Foundations of Electrical Engineering or 21-127 Concepts of Mathematics
36-217 Probability Theory and Random Processes
General Education course

Spring Sophomore
18-2xx ECE Core course
18-3xx/4xx ECE Area course
33-142 Physics II for Engineering and Physics Students
39-210 Experiential Learning I

Fall Senior
18-2xx ECE Core course
18-3xx/4xx ECE Area course
Math/Science Elective 2
Free Elective

Spring Senior
18-2xx ECE Coverage course
18-xxx ECE Coverage course
General Education course
Free Elective

Other Opportunities in ECE

ECE Cooperative Education Program

Our Cooperative Education Program invites students to gain valuable experience in employment that relates directly to their major and career goals. At the same time, it provides employers with opportunities to evaluate students as potential full-time employees, while having them complete meaningful projects. Participation in this program is voluntary, and obtaining a cooperative education assignment is competitive.

Due to federal restrictions on student work experiences, international students are not eligible for co-ops. Please visit the ECE CPT page (http://www.ece.cmu.edu/programs-admissions/bachelors/cpt.html) for information regarding international student internships.

The co-op experience

We require a minimum of eight months of co-op experience to identify the work experience as a co-op. Students must have minimally completed their sophomore year to qualify for application to a co-op and should connect...
with their Academic Advisor for information on how to apply. While on co-op assignment, students are participating in a recognized CIT educational program, retaining their full-time student status, akin to our students who study abroad in established exchange programs (such as EPFL) for one or two semesters. The Cooperative Education Program agreement may be discontinued if the employers do not provide the students with career-related work experience or if the students do not meet the accepted level of performance as defined by the employers.

Upon returning to Carnegie Mellon, the students are required to submit for approval the following two documents to the ECE Undergraduate Office: a three to five page technical report of the Co-Op work, and a one page assessment and evaluation of the Co-Op experience.

Students may obtain more detailed information through the ECE department (http://www.ece.cmu.edu/programs-admissions/bachelors/cooperative-education-program.html) or the Career and Professional Development Center (http://www.cmu.edu/career/).

Integrated M.S./B.S. Degrees Program

The Integrated Master’s/Bachelor’s program (http://www.ece.cmu.edu/programs-admissions/integrated/) (otherwise known as the IMB program) is an exciting opportunity for students who excel academically to achieve not just a Bachelor’s degree in ECE, but also a Master’s degree through our Professional MS degree program—without needing to apply separately. This means no application fee, and no need to take the GRE (Graduate Record Exam). In order to be awarded the MS degree in the IMB program, the student must also earn their BS degree, either simultaneously with the MS degree or at least one semester prior to the awarding of the MS degree. If a course is eligible for the MS degree but must be used to complete the BS degree, the BS degree takes priority over the MS degree.

If a student is at least a 2nd semester junior, has completed at least 270 units and has at least an overall 3.00 QPA, he or she is guaranteed admission into the Professional MS degree in ECE through the IMB program. To be officially admitted, the student must complete the IMB Program form.

If a student does not meet the overall 3.00 QPA requirement, he or she is eligible to petition for his or her admission into the IMB program during his or her senior year. Students may obtain the petition forms through a meeting with their assigned academic advisor.

Professional MS Degree Requirements:

Please see the ECE web site for the requirements for the Professional MS degree (http://www.ece.cmu.edu/programs-admissions/masters/ms-requirements.html). For students in the ECE IMB program, all requirements for the Professional MS degree are in addition to the requirements for the BS in ECE. No requirements for the MS degree may be used in any way toward the BS degree, including minors, additional majors or dual degrees.

Residency requirements and financial impacts:

Once a student in the IMB program has completed all of the requirements for the BS degree, he or she may become a graduate (Masters) student. To do this, the student’s undergraduate degree is certified, and that student officially graduates with the BS degree. Once a student’s undergraduate degree has been certified, no more courses may then be applied toward the BS degree. This includes courses toward minors and additional majors, although students pursuing an undergraduate dual degree with another department may still continue to apply additional coursework toward that second degree.

If a student takes more than 8 semesters to complete both the BS and MS degrees, then he or she must be a graduate student for at least one semester before graduating with the MS degree.

To determine the most appropriate time for an undergraduate student to become a graduate student, he or she should consult with Enrollment Services to understand how becoming a graduate student will affect financial aid, and with his or her academic advisor to determine a course schedule. When a student is a graduate student through the IMB program, the department is able to provide some financial assistance through Teaching Assistantships. Please see the ECE web site (http://www.ece.cmu.edu/programs-admissions/integrated/) for further information regarding this financial assistance.

Faculty

GEORGE AMVROSIADIS, Assistant Research Professor of Electrical and Computer Engineering, – Ph.D., University of Toronto, Canada; Carnegie Mellon, 2018

JIM BAIN, Associate Department Head for Academic Affairs and Professor of Electrical and Computer Engineering and Materials Science Engineering, 2018–

Associate Director, DSSC – Ph.D., Stanford University; Carnegie Mellon, 1993–

LUJO BAUER, Associate Professor of Electrical and Computer Engineering – Ph.D., Princeton University; Carnegie Mellon, 2005–

VIJAYAKUMAR BHAGAVATULA, U.A. and Helen Witaker Professor of Electrical and Computer Engineering, Affiliated Faculty, DSSC, Director CMU - Africa – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1982–

SHAWN BLANTON, Trustee Professor of Electrical and Computer Engineering – Ph.D., University of Michigan; Carnegie Mellon, 1995–

DAVID BRUMLEY, Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2008–

L. RICHARD CARLEY, ST Microelectronics Professor of Electrical and Computer Engineering; Affiliated Faculty, DSSC – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 1984–

MAYSAM CHAMANZAR, Assistant Professor of Electrical and Computer Engineering – Ph.D., Georgia Institute of Technology; Carnegie Mellon, 2015–

YUEJIE CHI, Associate Professor of Electrical and Computer Engineering – Ph.D., Princeton University; Carnegie Mellon, 2018–

ANUPAM DATTA, Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., Stanford University; Carnegie Mellon, 2007–

HAKAN ERODMUS, Teaching Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., Université du Québec; Carnegie Mellon, 2014–

GIULIA FANTI, Assistant Professor of Electrical and Computer Engineering – Ph.D., University of California at Berkeley; Carnegie Mellon, 2017–

GARY FEDDER, Howard M. Wilkoff Professor of Electrical and Computer Engineering Co-Director, MEMS Affiliated Faculty, DSSC – Ph.D., University of California at Berkeley; Carnegie Mellon, 1994–

FRANZ FRANCHETTI, Professor of Electrical and Computer Engineering; Faculty Director IT Services – Ph.D., Vienna University of Technology; Carnegie Mellon, 2001–

GREGORY R. GANGER, Jatras Professor of Electrical and Computer Engineering and Computer Science; Director Parallel Data Lab – Ph.D., University of Michigan; Carnegie Mellon, 1997–

AMINATA GARBA, Assistant Teaching Professor of Electrical and Computer Engineering; Carnegie Mellon University Africa – Ph.D., McGill University; Carnegie Mellon, 2013–

SAUGATA GHOSE, Systems Scientist of Electrical and Computer Engineering – Ph.D., Cornell University; Carnegie Mellon, 2017–

PHILLIP GIBBONS, Professor of Electrical and Computer Engineering and Computer Science – Ph.D., University of California at Berkeley; Carnegie Mellon, 2015–

VIRGIL GLIGOR, Professor of Electrical and Computer Engineering; Co-Director CyLab – Ph.D., University of California, Berkeley; Carnegie Mellon, 2008–

PULKIT GROVER, Associate Professor of Electrical and Computer Engineering – Ph.D., University of California at Berkeley; Carnegie Mellon, 2013–

JAMES HOE, Professor of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2000–

BOB IANNUCCI, Distinguished Service Professor of Electrical and Computer Engineering; Director, CyLab Mobility Research Center; Carnegie Mellon University Silicon Valley – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2012–

JOVAN ILIC, Associate Teaching Professor of Electrical and Computer Engineering – Ph.D., The University of Tennessee; Carnegie Mellon, 2014–

LIMIN JIA, Associate Research Professor of Electrical and Computer Engineering; Affiliated Faculty, CyLab; – Ph.D., Princeton University; Carnegie Mellon, 2013–

CARLEE JOE-WONG, Assistant Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., Princeton University; Carnegie Mellon, 2016–

GAURI JOSHI, Assistant Professor of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2017–

SOUMYA KAR, Associate Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2011–
HYONG S. KIM, Drew D. Perkins Professor of Electrical and Computer Engineering; Director, CMU-Thailand – Ph.D., University of Toronto; Carnegie Mellon, 1990–

PHILIP J. KOOPMAN, Associate Professor of Electrical and Computer Engineering and Computer Science – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1989–

SWARUN S. KUMAR, Assistant Professor of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2015–

IAN LANE, Associate Research Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., Kyoto University; Carnegie Mellon, 2011–

QING LI, Assistant Professor of Electrical and Computer Engineering – Ph.D., Georgia Institute of Technology; Carnegie Mellon, 2018–

TZE MENG LOW, Assistant Research Professor of Electrical and Computer Engineering – Ph.D., University of Texas at Austin; Carnegie Mellon, 2013–

BRANDON LUCIA, Assistant Professor of Electrical and Computer Engineering – Ph.D., University of Washington; Carnegie Mellon, 2014–

KEN MAI, Principal Systems Scientist of Electrical and Computer Engineering – Ph.D., Stanford University; Carnegie Mellon, 2005–

DIANA MARCULESCU, David Edward Schramm Professor of Electrical and Computer Engineering; - Ph.D., University of Southern California; Carnegie Mellon, 2000–

RADI MARCULESCU, Kavčić-Moura Professor of Electrical and Computer Engineering – Ph.D., University of Southern California; Carnegie Mellon, 2000–

PIOTR MARDZIEL, Systems Scientist of Electrical and Computer Engineering – Ph.D., University of Maryland, College Park; Carnegie Mellon, 2018–

JAVAD MOHAMMADI, Systems Scientist of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2016–

M. GRANGER MORGAN, Professor of Electrical and Computer Engineering; Higher Education Professor of Engineering and Public Policy – Ph.D., University of California, San Diego; Carnegie Mellon, 1974–

JOSE M. F. MOURA, Associate Department Head for Research & Strategic Initiatives, Philip L. and Marsha Dowd University Professor of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 1986–

LINDA MOYA, Assistant Teaching Professor of Electrical and Computer Engineering; Social and Decision Sciences – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2014–

TAMAL MUKHERJEE, Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1996–

WILLIAM NACE, Associate Teaching Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2008–

PRIYA NARASIMHAN, Professor of Electrical and Computer Engineering – Ph.D., University of California at Santa Barbara; Carnegie Mellon, 2001–

ROHIT NEGI, Professor of Electrical and Computer Engineering – Ph.D., Stanford University; Carnegie Mellon, 2000–

DAVID O’HALLARON, Professor of Electrical and Computer Engineering and Computer Science – Ph.D., University of Virginia; Carnegie Mellon, 1989–

JEYANANDH PARAMESH, Associate Professor of Electrical and Computer Engineering and Computer Science – Ph.D., University of California at Berkeley; Carnegie Mellon, 2012–

BARRY RAWIN, Associate Teaching Professor of Electrical and Computer Engineering – Ph.D., University of Toronto, Canada; Carnegie Mellon, 2018–

ANTHONY ROWE, Associate Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2009–

ASWIN SANKARANARAYANAN, Associate Professor of Electrical and Computer Engineering – Ph.D., University of Maryland; Carnegie Mellon, 2013–

MARIOS SAVVIDES, Research Professor of Electrical and Computer Engineering, Bossa Nova Robotics Professor of Artificial Intelligence, Director, CyLab Biometrics Center – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2005–

VIAS SEKAR, Associate Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2013–

JOHN SHEN, Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., University of Southern California; Carnegie Mellon, 2015–

DANIEL P. SIEWOREK, Buhl University Professor of Electrical and Computer Engineering; Human Computer Interaction Institute of Computer Science Department – Ph.D., Stanford University; Carnegie Mellon, 1972–

VIRGINIA SMITH, Assistant Professor of Electrical and Computer Engineering – Ph.D., University of California, Berkeley; Carnegie Mellon, 2018–

PETER STEENKISTE, Professor of Electrical and Computer Engineering and Computer Science – Ph.D., Stanford University; Carnegie Mellon, 1987–

RICHARD STERN, Professor of Electrical and Computer Engineering, Language Technologies Institute, Computer Science, and BioMedical Engineering; Lecturer, Music – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 1977–

ANDRZEJ J. STROJWAS, Keithley Professor of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1983–

THOMAS SULLIVAN, Teaching Professor of Electrical and Computer Engineering; Lecturer, Music – Ph.D., Carnegie Mellon University; Carnegie Mellon, 1996–

PATRICK TAGUE, Associate Research Professor of Electrical and Computer Engineering, CyLab and Information Networking Institute, Carnegie Mellon University Silicon Valley – Ph.D., University of Washington; Carnegie Mellon, 2009–

OZAN TONGUZ, Professor of Electrical and Computer Engineering – Ph.D., Rutgers University; Carnegie Mellon, 2000–

ELIAS TOWE, Professor of Electrical and Computer Engineering; Grostein Memorial Professor of Materials Science and Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2001–

DAVID VERNON, Professor of Electrical and Computer Engineering; Carnegie Mellon University Africa – Ph.D., Trinity College Dublin; Carnegie Mellon, 2017–

OSMAN YAĞAN, Associate Research Professor of Electrical and Computer Engineering – Ph.D., University of Maryland, College Park; Carnegie Mellon, 2013–

BYRON YU, Associate Professor of Electrical and Computer Engineering; Assistant Professor Biomedical Engineering – Ph.D., Stanford University; Carnegie Mellon, 2009–

JIA ZHANG, Associate Teaching Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., University of Illinois, Chicago; Carnegie Mellon, 2014–

PEI ZHANG, Associate Research Professor of Electrical and Computer Engineering; Carnegie Mellon University Silicon Valley – Ph.D., Princeton University; Carnegie Mellon, 2008–

XU ZHANG, Assistant Professor of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2019–

JIAN-GANG ZHU, ABB Professor of Electrical and Computer Engineering; Department – Ph.D., University of Southern California; Carnegie Mellon, 2007–

 CONFERENCE COMMITTEE

CONFERENCE COMMITTEE

5

Department of Electrical and Computer Engineering

YURVRAJ AGARWAL, Assistant Professor of Computer Science; Courtesy Faculty of Electrical and Computer Engineering – Ph.D., University of California, San Diego; Carnegie Mellon, 2013–

NATHAN BECKMANN, Assistant Professor of Computer Science; Courtesy Faculty of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 2017–

COURTESY
MARIO BERGES, Assistant Professor of Civil and Environmental Engineering; Courtesy Faculty of Electrical and Computer Engineering – Ph.D., Carnegie Mellon University; Carnegie Mellon, 2017–

TIMOTHY X. BROWN, Distinguished Service Professor, Engineering and Public Policy, Civil and Environmental Engineering; Courtesy Faculty of Electrical and Computer Engineering – Ph.D., California Institute of Technology; Carnegie Mellon, 2013–

RANDAL E. BRYANT, University Professor of Computer Science; Courtesy Faculty of Electrical and Computer Engineering – Ph.D., Massachusetts Institute of Technology; Carnegie Mellon, 1984–

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