Sanjay Raman has been named the dean of the College of Engineering. He joins us from Virginia Tech (VT) where he was associate vice president for the VT National Capital Region, president and CEO of the Virginia Tech Applied Research Corporation, and a tenured full professor in their Bradley Department of Electrical and Computer Engineering (ECE). From 2007-13, Raman was a program manager in the Defense Advanced Research Projects Agency (DARPA) Microsystems Technology Office.

Raman earned his doctorate in electrical engineering from the University of Michigan, Ann Arbor, in 1998 and joined the ECE faculty at VT. Prior to his doctoral studies, Raman served as a nuclear-trained submarine officer in the U.S. Navy from 1987-92. He is an elected fellow of the Institute for Electrical and Electronics Engineers (IEEE) for leadership in adaptive microwave and millimeter-wave integrated circuits.

On the Cover

The Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) is revolutionizing weather-sensing networks to help save lives. Using a system of low-cost radars that communicate with each other, CASA tracks weather conditions in the lower atmosphere unseen by conventional radar. When the Dallas-Fort Worth region of Texas experiences extreme weather, like in spring 2019, CASA data is used by National Weather Service (NWS) forecasters and emergency managers to support their decision making and rescue efforts. On the UMass Amherst campus, CASA and the Microwave Remote Sensing Laboratory (MIRSL) operate a weather radar to support the campus’s emergency management efforts and share data with the NWS Eastern Region Headquarters. Skyler, a next-generation phased-array radar, on loan from Raytheon, is also operated on campus.
National Science Foundation Faculty Early Career Development (CAREER) Award Recipients

**JUAN JIMÉNEZ (MIE)**
Elucidating the role of fluid flow in endothelial cell migration signaling pathways and implications in wound healing after stent implantation.

**STEPHEN NONNENMANN (MIE)**
Enhancing electroactivity and tailoring vacancy distributions of heterostructured oxide interfaces, as monitored by in situ high temperature scanning probes.

**YUBING SUN (MIE)**
Identifying the mechanical and biochemical regulatory mechanisms of planar cell polarity (PCP) in vitro.

**JUN YAO (ECE)**
Developing multifunctional nanobiosensors for cell interface, leading to more precise biomedical devices for disease modeling, drug screening, and health diagnostics.

---

**GRANT HIGHLIGHTS**

**Jungwoo Lee** (ChE) received a five-year, $1.76 million grant from the National Cancer Institute to study how cancer cells in the human body that have left the original site of the cancer could change from dormant to active due to chemotherapy.

**Jay Taneja** (ECE) is the lead principal investigator for a four-university consortium aiming to use enhanced data modeling and predictive techniques to transform electricity systems in emerging economies — expanding access to reliable, affordable power. This consortium is funded by a $3.8 million grant from The Rockefeller Foundation.

**Guangyu Xu** (ECE) is part of a UMass Amherst team of scientists awarded a four-year, $953,300 grant from the National Science Foundation to develop optical probes for observing and stimulating living neural cells.
Grand Opening of Engineering Hub

The new Engineering Hub in Marcus Hall features modular study and group meeting spaces for our graduate student population as well as our interdepartmental engineering student organizations. It includes the Community, Equity and Inclusion (CEI) Hub, a marquee space that demonstrates our college-wide commitment to inclusion and student support.

2019 “Best Design Execution” award at the SAE Supermileage Competition

Yizhuo (E.J.) Chen ’20 (ChE) and Avi Benmayor ’22 (MIE) won $20,000 in the UMass Innovation Challenge as a part of team Renovare — developing a novel bandage to heal skin abrasions quickly by using a polymer membrane and a tiny control system (a chip) to stimulate replication of cells close to the skin’s surface.

The UMass Rocket Team received national news coverage for their perseverance in NASA’s annual student launch competition. A Fox News story shared the team’s comeback after their rocket was destroyed during a test launch in Vermont — days before their deadline to demonstrate a full-scale launch. Working around the clock, the team redesigned, built, and successfully launched a new rocket in less than a week to remain in the competition.

Doctoral student Julie Bliss Mullen (CEE), co-founder/CEO of Aclarity LLC, has been named to the Forbes “30 under 30 in Science” list for 2019. She also received a 2019 student prize from the Lemelson-MIT Program.
FACULTY HIGHLIGHTS

Michael Henson (ChE) was named a Fellow of the American Institute of Chemical Engineers

Dimitrios Maroudas (ChE) was elected Fellow of The American Association for the Advancement of Science

David Reckhow (CEE) received the 2019 A.P. Black Research Award from the American Water Works Association

David Schmidt (MIE) received the Lewis F. Moody Award from the American Society of Mechanical Engineers

John Tobiason (CEE) received the 2019 Association of Environmental Engineering and Science Professors Charles R. O’Melia Distinguished Educator Award

New Faculty 2018–19

Professor

Seth Donahue (BME): Evolutionary biomechanics, tissue regeneration, and physiology

Assistant Professor

Omar Abdelrahman (ChE): Catalyst discovery, characterization, and kinetic modeling

Konstantinos Andreadis (CEE): Water resources modeling; hydrologic remote sensing

Peng Bai (ChE): Molecular modeling and catalysis; machine learning of catalysis and separation in complex systems

Wen Chen (MIE): Mechanical behavior of materials, materials design, physical metallurgy, and additive manufacturing

Jinglei Ping (MIE): Nano-bio interfaces and applications

Anuj Pradhan (MIE): Human factors of advanced vehicle technologies and automation

Govind Srimathveeravalli (MIE): Cancer treatment; immunotherapy; drug delivery and tissue engineering

Yanfei Xu (MIE): Thermal, electrical, and optical properties of polymers and carbon-based nanomaterials
Undergraduate Profile 2018–19

Our undergraduate population represents every county in Massachusetts, 28 U.S. states, and 36 countries. 92% grad placement* May 2018 of those who reported

Enrollment by department (2,250 total):

<table>
<thead>
<tr>
<th>Department</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>41</td>
</tr>
<tr>
<td>ChE</td>
<td>240</td>
</tr>
<tr>
<td>CEE</td>
<td>228</td>
</tr>
<tr>
<td>ECE</td>
<td>309</td>
</tr>
<tr>
<td>MIE</td>
<td>584</td>
</tr>
<tr>
<td>Pre-Engineering</td>
<td>848</td>
</tr>
</tbody>
</table>

Graduate Profile 2018–19

Our graduate student community includes members from 33 countries and all regions of the U.S., providing a vibrant mix of cultures, perspectives, and experiences.

Enrollment by department (610 total):

<table>
<thead>
<tr>
<th>Department</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>BME</td>
<td>3 PhD</td>
</tr>
<tr>
<td></td>
<td>4 MS, 60 PhD</td>
</tr>
<tr>
<td>ChE</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>54 MS, 60 PhD</td>
</tr>
<tr>
<td>CEE</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>154 MS, 99 PhD</td>
</tr>
<tr>
<td>ECE</td>
<td>253</td>
</tr>
<tr>
<td></td>
<td>88 MS, 88 PhD</td>
</tr>
<tr>
<td>MIE</td>
<td>176</td>
</tr>
</tbody>
</table>

Research

FISCAL YEAR 19 ($29.8M)

Expenditures by department

- BME: $11M
- ChE: $5.8M
- CEE: $3.8M
- ECE: $8.9M
- MIE: $305K

Representative Sponsors:

- National Aeronautics and Space Administration (NASA)
- National Institutes of Health (NIH)
- National Science Foundation (NSF)
- Raytheon
- Rockefeller Foundation
- U.S. Department of Energy

OUTSTANDING ALUMNI AWARDS

2018/19 recipients of the College of Engineering Outstanding Senior Alumni Award were: Mark Bradley ’79 ChE; Sadiye Guler ’96 PhD ECE; Jennifer Jordan ’93, ’96 MS CEE; Frank Riordan ’91 MIE.

2018/19 recipients of the College of Engineering Outstanding Junior Alumni Award were: Daniel Amichetti ’12 ChE; Seth Berkowitz ’12 ECE; Kenneth Canty ’98 CEE; Brian Mullen ’04, ’07 MS, ’09 PhD MIE.
STUDENTS IN 2018–2019
Undergraduate: 2,250
Master's Candidates: 300
Doctoral Candidates: 310

ENTERING FIRST-YEAR STUDENTS, FALL 2018
577 enrolled
4.01 mean weighted GPA
1290-1400 SAT mid 50% range

DEGREES AWARDED
ACADEMIC YEAR 2018–2019
Bachelor's: 484
Master's: 155
Doctoral: 44

FACULTY IN 2018–2019
Tenure Track: 128
Lecturers: 15
Research Faculty: 5

U.S. News & World Report
ENGINEERING SCHOOL RANKING
Undergraduate (September 2018): #59 overall; #33 among public universities
Graduate Programs (March 2019): #58 overall; #31 among public universities

CAREER PLACEMENT — UNDERGRADUATE
CLASS OF 2018, 6 MONTHS OUT
Total # of 2017–18 graduates: 454
Knowledge rate/reported: 88%
Placement of those who reported: 92%
Median starting salary: $65,000

TOTAL COLLEGE REVENUE FY 2019
Total: $68.5 Million
Sources: Current Gifts 1.9%; Fee Income/Misc. 4.6%; Sponsored Research 58.9%; Campus Appr. 34.6%

FUNDS RAISED FY 2019
Total donors: 1,690
Total raised: $7.95 Million

LEADERSHIP
Sanjay Raman, Dean
Russell Tessier, Senior Associate Dean
Erin Baker, Associate Dean
James Rinderle, Associate Dean

Engineering Department Heads:
C.V. Hollot, ECE
John Klier, ChE
Sundar Krishnamurty, MIE
John Tobison, CEE
Tilman Wolf, Interim, BME

ACADEMIC DEGREES
Biomedical Engineering (BS, MS, PhD)
Chemical Engineering (BS, MS, PhD)
Civil Engineering (BS, MS, PhD)
Computer Engineering (BS)
Electrical and Computer Engineering (MS, PhD)
Electrical Engineering (BS)
Engineering Management (MS)
Environmental Engineering (MS)
Industrial Engineering (BS, MS, PhD)
Mechanical Engineering (BS, MS, PhD)

CONTINUING & PROFESSIONAL EDUCATION DEGREES
Electrical and Computer Engineering (MS)
Engineering Management (MS)

GRADUATE CERTIFICATES
Computer Networking
Computer Systems Security
Embedded Systems
Internet of Things
Wind Power

CENTERS AND INSTITUTES
Center for Biological Physics
Center for Collaborative Adaptive Sensing of the Atmosphere
Center for e-Design
Center for Energy Efficiency and Renewable Energy
Center for Hierarchical Manufacturing
Climate System Research Center
Cybersecurity Institute
Institute for Applied Life Sciences
Center for Bioactive Delivery
Center for Personalized Health Monitoring
Models to Medicine Center
The Institute for Massachusetts Biofuels Research (TimBR)
MassNanoTech Institute
Materials Research Science and Engineering Center
Microwave Remote Sensing Laboratory (MIRSL)
Northeast Climate Adaptation Science Center
UMass Transportation Center (UMTCT)
Water Resources Research Center
Wind Energy Center
WINSSS: Water Innovation Network for Sustainable Small Systems

Abbreviations
BME..... Biomedical Engineering
CEE....... Civil and Environmental Engineering
ChE....... Chemical Engineering
ECE...... Electrical and Computer Engineering
MIE....... Mechanical and Industrial Engineering

PRODUCTION
Writing: Heather Demers & Charlie Creekmore; Design: Sarah Harvey; Photography: Ben Barnhart, John Solem, Dallas-Fort Worth National Weather Service, and other contributors.