UC RIVERSIDE
Marlan and Rosemary Bourns
College of Engineering

ENGINEERING
UNDERGRADUATE PROGRAMS

https://undergraduate.engr.ucr.edu/

UNIVERSITY OF CALIFORNIA, RIVERSIDE

U.S.News & WORLD REPORT

Ranked **America's fastest rising ranked university**, 2021

UNIVERSITY OF CALIFORNIA

One of **University of California**'s 10 prestigious universities

TOP RANKED, ACADEMICALLY CHALLENGING, AND READY FOR YOU

BEST IN EDUCATION & OPPORTUNITY

No. 1
Top performer in **social mobility** in the nation; U.S. News, 2021

TOP 1%
Of universities **worldwide**; Center for World University Rankings, 2019-20

TOP 35
Best value public colleges in America; Money Magazine, 2020

BEST VALUE UNIVERSITY

TOP 12
Public universities in the nation; Forbes, "America's Best Value Colleges"

No. 14
U.S. college that pay off the most in 2020; CNBC Make It, 2020

TOP 20
America's **best value** colleges among public universities; Princeton Review, 2020

MARLAN AND ROSEMARY BOURNS COLLEGE OF ENGINEERING

10
Undergraduate Programs

134
Award-Winning Faculty Members

3300
Undergraduate Students

24:1
Undergraduate Student to Faculty Ratio

$44M
in Research Grants Awarded (2021)

HIGHLY RANKED ENGINEERING COLLEGE

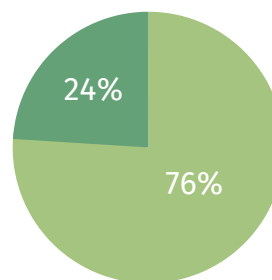**TOP 50** Public engineering college in the nation; U.S. News, 2021

No. 20 Best global university for engineering; U.S. News, 2021

No. 31 Best school of engineering majors by salary potential in the U.S.; Payscale 2020 College Salary Report

A WELCOMING PLACE FOR FIRST-YEAR & TRANSFER STUDENTS

24%
76%

First-Year Students
Transfer Students

UCR's 4,300-square-foot machine shop

UNDERGRADUATE PROGRAMS

BIOENGINEERING Ⓑ ⊕

CHEMICAL ENGINEERING Ⓑ ⊕

COMPUTER ENGINEERING Ⓑ ⊕

COMPUTER SCIENCE Ⓑ ⊕

COMPUTER SCIENCE WITH BUSINESS APPLICATIONS Ⓑ

DATA SCIENCE Ⓑ

ELECTRICAL ENGINEERING Ⓑ ⊕

ENVIRONMENTAL ENGINEERING Ⓑ ⊕

MATERIALS SCIENCE AND ENGINEERING Ⓑ

MECHANICAL ENGINEERING Ⓑ ⊕

*The BS+MS program is only available to currently enrolled UCR undergraduate engineering students

BIOENGINEERING Ⓑ ⊕

The Bioengineering program is home to an immersive, interdisciplinary experience offering students exposure to the fields of bioengineering, biomedical engineering, and biotechnology. Many graduates go on to careers in the medical field, pharmaceutical industry, food industry, or medical school.

ALUMNI EMPLOYED AT PLACES INCLUDING:

Edwards   Abbott   THORLABS

EXAMPLES OF COURSES

- BIEN 110 Biomechanics of the Human Body
- BIEN 125 Biotechnology & Molecular Bioengineering
- BIEN 130 Bioinstrumentation
- BIEN 138 Fundamental Principles of Wound Repair
- BIEN 166 Bioinspired Engineering for Sustainable Energy

Website: www.bioeng.ucr.edu
Email: big@engr.ucr.edu
Phone Number: (951) 827-4303

FUTURE OUTLOOK

6%
Expected increase in job outlook
2020-2030

19,300
Total number of jobs
2020

$92,620
Average pay
2020

Source: BLS.org

CHEMICAL ENGINEERING B +

The Chemical Engineering program allows students to turn the discoveries of chemists and physicists into commercial realities in industries such as pharmaceuticals, fuels, pollution control, medicine, and nuclear and electronics. Students can choose one of three focus areas: Biochemical Processes, Nanotechnology, or Chemical Engineering.

ALUMNI EMPLOYED AT PLACES INCLUDING:

EXAMPLES OF COURSES

- CHE 131 Electrochemical Engineering
- CHE 136 Advanced Topics in Heat Transfer
- CHE 150 Biosensors
- CHE 161 Nanotechnology Processing Laboratory
- CHE 171 Pollution Control for Chemical Engineers

FUTURE OUTLOOK

9%
Expected increase in job outlook
2020-2030

26,300
Total number of jobs
2020

$108,540
Average pay
2020

COMPUTER ENGINEERING B +

COMBINING ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

The Computer Engineering program offers the knowledge and skills needed to build and improve computing systems – both hardware and software – ranging from small scale embedded devices to data centers and supercomputers. Create your own computers, video games, or build and program a robot from scratch.

ALUMNI EMPLOYED AT PLACES INCLUDING:

EXAMPLES OF COURSES

- CS 134 Video Game Creation and Design
- CS 162 Computer Architecture
- CS 177 Modeling and Simulation
- EE 136 Semiconductor Device Processing
- EE 146 Computer Vision

FUTURE OUTLOOK

2%
Expected increase in job outlook
2020-2030

66,200
Total number of jobs
2020

$119,560
Average pay
2020

Source: BLS.org

COMPUTER SCIENCE B +

The Computer Science program is highly ranked and provides an understanding of fundamental principles of modern computing technology to secure careers in areas like cyber security, high performance computing, systems and networks, architecture, embedded systems, and more.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

facebook   ORACLE   esri
                                  THE SCIENCE OF WHERE

EXAMPLES OF COURSES

- CS 061 Machine Organization and Assembly Language Programming
- CS 122B Advanced Embedded and Real-Time Systems
- CS 160 Concurrent Programming and Parallel Systems
- CS 165 Computer Security
- CS 166 Database Management Systems

FUTURE OUTLOOK

22%
Expected increase in job outlook
2020-2030

33,000
Total number of jobs
2020

$126,830
Average pay
2020

COMPUTER SCIENCE WITH BUSINESS APPLICATIONS B

The Computer Science with Business Applications program is designed to prepare graduates for professional work with computer systems and business environments.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

gm   amazon   KLA+

EXAMPLES OF COURSES

- CS 169 Mobile Wireless Networks
- CS 182 Software Testing and Verification
- MATH 135 A/B Numerical Analysis
- BUS 125 Simulation for Business
- BUS 173 Introduction to Databases for Management

FUTURE OUTLOOK

22%
Expected increase in job outlook
2020-2030

33,000
Total number of jobs
2020

$126,830
Average pay
2020

Source: BLS.org

DATA SCIENCE ⓑ

The Data Science program bridges core components from Computer Science and Statistics and focuses on studying the collection, management, and analysis of data to extract knowledge.

Data science researchers work to make sense of data banks in novel ways by finding statistically and computationally efficient solutions.

The Data Science program launched in 2020 and is expected to graduate its first class in 2021.

EXAMPLES OF COURSES

- CS 105 Data Analysis Methods
- CS 167 Introduction to BIG-DATA Management
- MATH 120 Optimization
- STAT 140 Nonparametric Techniques
- STAT 146 Statistical Forecasting Techniques

FUTURE OUTLOOK

22%
Expected increase in
job outlook
2020-2030

33,000
Total number of jobs
2020

$126,830
Average pay
2020

ELECTRICAL ENGINEERING ⓑ ➕

The Electrical Engineering program is designed to focus on six areas: communications, signal processing and networking; control and robotics; embedded systems and VLSI; intelligent systems; nanotechnology, advanced materials and devices; and power systems and smart grid.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

EXAMPLE OF COURSES

- EE 116 Engineering Electromagnetics
- EE 123 Power Electronics
- EE 135 Analog Integrated Circuit Layout and Design
- EE 142 Pattern Recognition and Analysis for Sensor Data
- EE/ME 145 Robotics Planning and Kinematics

FUTURE OUTLOOK

7%
Expected increase in
job outlook
2020-2030

313,200
Total number of jobs
2020

$103,390
Average pay
2020

Source: BLS.org

ENVIRONMENTAL ENGINEERING B +

The Environmental Engineering program focuses on technical knowledge to identify, design, build, and operate systems. Career pathways may include air pollution, water quality, wastewater treatment, and global environmental issues.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

CALIFORNIA AIR RESOURCES BOARD   ARCADIS   UNITED STATES SENATE

EXAMPLE OF COURSES

- ENVE 134 Technology of Air Pollution Control
- ENVE 146 Water Quality Systems Design
- CHE 102 Catalytic Reaction Engineering
- CEE 132 Green Engineering
- ENVE 145 Hazardous Waste Management

FUTURE OUTLOOK

4%
Expected increase in
job outlook
2020-2030

52,300
Total number of jobs
2020

$92,120
Average pay
2020

MATERIALS SCIENCE AND ENGINEERING B

The interdisciplinary Materials Science and Engineering program combines physics, chemistry and mathematics to predict, modify and tailor materials properties at the electrical, optical, magnetic, mechanical, and chemical levels to enhance performance.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

Sandia National Laboratories   UTC Aerospace Systems   HRC HONDA RACING

EXAMPLE COURSES

- BIEN/MSE 136 Tissue Engineering
- EE 162 Introduction to Nanoelectronics
- MSE 143 Failure Analysis and Prevention
- EE 139 Magnetic Materials
- MSE 156 Atomistic Modeling of Materials

FUTURE OUTLOOK

6%
Expected increase in
job outlook
2020-2030

92,400
Total number of jobs
2020

$80,680
Average pay
2020

Source: BLS.org

MECHANICAL ENGINEERING

Website: www.me.ucr.edu
Email: me-gradprogram@engr.ucr.edu
Phone Number: (951) 827-5830

The Mechanical Engineering program allows students to learn the fundamentals of modern-engineering software computing tools, gain hands-on experience in measurement science, apply basic principles of solid mechanics, materials science, fluid mechanics, and heat transfer in laboratories, and utilize modern engineering design principles and tools.

ALUMNI ARE EMPLOYED AT PLACES INCLUDING:

NAVSEA WARFARE CENTERS   TESLA   SPACEX

EXAMPLE COURSES

- ME 113 Fluid Mechanics
- ME 117 Combustion and Energy Systems
- ME 176 Sustainable Product Design
- ME 180 Optics and Laser in Engineering
- ME 136 Environmental Impacts of Energy Production and Conversion

FUTURE OUTLOOK

7%
Expected increase in job outlook
2020-2030

299,200
Total number of jobs
2020

$90,160
Average pay
2020

Source: BLS.org

AVAILABLE TO CURRENT UCR ENGINEERING STUDENTS PURSUING A BACHELOR'S DEGREE

BACHELOR'S+MASTER'S PROGRAM

LEARN MORE: HTTPS://STUDENT.ENGR.UCR.EDU/BS-MS-REQUIREMENTS

PROGRAM BENEFITS

Earn a M.S. degree in **as little as three quarters**

Half the cost of a traditional M.S. degree

No GRE requirement

Guaranteed admission if requirements are met

MEET A FUTURE GRAD

Keith Z.
B.S.+M.S. student and future software engineer at zyBooks

"The B.S.+M.S. program allowed me to gain a more fine-grained understanding of my field, dive into new research areas and develop my technical skills. I would recommend this program to anyone wishing to 'level up' in a timely and cost-effective manner."

$15k+
Engineering Master's graduates report earning $10,000-$15,000 more upon graduation
U.S. Bureau of Labor Statistics
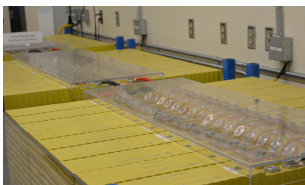
WORLD-CLASS RESEARCH CENTERS

CENTER FOR ENVIRONMENTAL RESEARCH AND TECHNOLOGY
(CE-CERT)

CE-CERT addresses society's most pressing environmental challenges in air quality, climate change, energy, and transportation. **cert.ucr.edu**
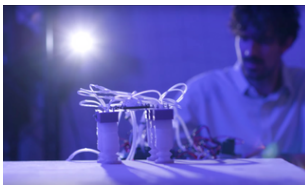

CENTER FOR INDUSTRIAL BIOTECHNOLOGY (CIB)

CIB seeks to unlock the full potential of industrial biotechnology applications in the areas of healthcare, agriculture, industrial chemistry, and biofuels. **cib.ucr.edu**

WINSTON CHUNG GLOBAL ENERGY CENTER (WCGEC)

WCGEC focuses on developing emerging energy solutions related to storage, generation and distribution to advance the science and applications of energy technology. **wcgec.ucr.edu**

CENTER FOR ROBOTICS AND INTELLIGENT SYSTEMS (CRIS)

CRIS researchers focus on the foundations and applications of intelligent and autonomous systems, including robotics, computer vision, controls, machine learning, and real-time systems. **www.cris.ucr.edu**

CENTER FOR ADVANCED NEUROIMAGING (UCR-CAN)

UCR-CAN researchers are taking a deeper dive into the brain than ever before, uncovering the secrets of brain disorders, mapping and accessing connectivity, and visualizing deep-brain structures. **can.ucr.edu**

CENTER FOR NETWORKED CONFIGURABLE COMMAND, CONTROL AND COMMUNICATIONS FOR RAPID SITUATIONAL AWARENESS (NC4)

NC4 studies fundamental research issues involved in creating robust, resilient command, control, and communication systems that lead to more accurate and timely situational awareness. **nc4.ucr.edu**

Biomedical

Cyber Security

Network Communications

Sustainability

Biotechnology

Energy

Robotics and Intelligent Systems

CENTER FOR RESEARCH AND EDUCATION IN CYBER SECURITY AND PRIVACY (CRESP)

CRESP works on designing novel approaches to building secure systems and enabling them to detect, resist, and tolerate attacks. https://cresp.ucr.edu

CENTER FOR UBIQUITOUS COMMUNICATION OF LIGHT (UC-LIGHT)

UC-Light enables wireless communications by embedding signals into the light emitted by next-generation LEDs in systems for illumination, traffic control, advertising, and other purposes. www.uclight.ucr.edu

ENERGY, ECONOMICS, AND ENVIRONMENT RESEARCH CENTER (E3)

E3 determines how society can best integrate the energy system, the economic system and built environment to provide for growing demand of energy in an economical and sustainable manner. e3.ucr.edu

CE-CERT is home to the world's largest known indoor atmospheric chamber.

STUDENT PROFESSIONAL ORGANIZATIONS

CHOOSE FROM 20+ STUDENT PROFESSIONAL ORGANIZATIONS

Build your engineering community and put to use all you learn in the classroom. From student projects to community outreach events and leadership workshops to industry networking, student professional organizations enhance your college experience and your future success. At BCOE, you can choose from more than 20 organizations including:

BREAKING RECORDS WITH STUDENT ORGANIZATION SUPPORT

NSBE BECOMES THE FIRST TO ENDOW A FUND SUPPORTING A STUDENT ORGANIZATION

The National Society of Black Engineers chapter at UCR established the first endowed fund in the university's history to support a student organization. The fund will support in perpetuity NSBE's mentorship and professional development opportunities including annual resources for professional development activities, invited industry speakers, leadership and research conference experiences, and community outreach.

> *The NSBE Fund will provide practical support and remind Black engineers at UCR that their predecessors believe wholeheartedly in both their success and commitment to becoming engineers. When faced with obstacles, students will know they have a strong community to depend on.*

Keilani Conner '20, past NSBE President

RESEARCH OPPORTUNITIES AND CAREER OUTCOMES

NEW WAYS TO INNOVATE
A NEW MAKERSPACE TO CREATE

Fall 2021 marked the launch of a third new makerspace for all students to turn their ideas into reality. The new Electrical Engineering Makerspace features soldering stations, 3D printers, a milling machine, drillpress, high-end oscilloscope, capacitors, and much more.

Not an electrical engineer? No problem, we have two other engineering makerspaces just for you!

FIND YOUR MAKERSPACE

- ELECTRICAL ENGINEERING MAKERSPACE
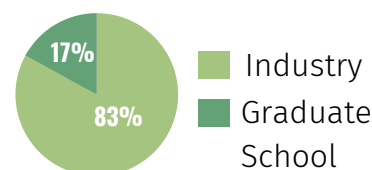
- MECHANICAL ENGINEERING MACHINE SHOP

- UCR CREAT'R LAB MAKERSPACE

SUCCESSFUL CAREERS START HERE

50%+

of engineering undergraduates report conducting research in faculty laboratories

$78K

Average reported salary of engineering B.S. graduates (Class of 2020)

17%
83%

- Industry
- Graduate School

B.S. graduates who reported career next steps (Class of 2020)

BECOME AN ENTREPRENEUR
FROM IDEATION TO LAUNCH, WE HAVE RESOURCES TO FAST TRACK YOUR BUSINESS

ENTREPRENEURIAL PROOF OF CONCEPT AND INNOVATION CENTER (EPIC)
A path-to-market platform to validate ideas, build teams, and launch companies

EPIC SMALL BUSINESS DEVELOPMENT CENTER (SBDC)
Provides early-stage tech entrepreneurs support such as training and consulting at no cost

INTERNATIONAL PARTNERSHIPS
Facilitates entrepreneurship capacity building and technology transfer across the globe

EXCITE STARTUP INCUBATOR
A community partnership providing startups with facilities, workshops, and support

UCR LIFE SCIENCE INCUBATOR
A new lab outfitted to house companies in agtech, biomedical, bioengineering, and medicinal chemistry

LAUNCHPAD @ UCR
Helps students succeed in entrepreneurship and careers by providing on- and off-campus opportunities to expand their reach

YOUR HOME AWAY FROM HOME

TOP EATERIES

Enjoy American and international cuisine at all-you-can-eat dining halls, grab a coffee or snack at our coffee shops and convenience stores, or have a meal at The Barn, UCR's legendary dining and entertainment space.

STATE-OF-THE-ART RECREATION CENTER

Get fit by climbing "The Rock", running the indoor track, or playing at the raquetball, squash and tennis courts. Plus, swim laps at the pool, learn to cook in the classroom kitchen, and take on the outdoor Challenge Course!

FESTIVALS AND EVENTS

With weekly concerts and cultural celebrations at the Bell Tower, food truck festivals, epic Block Party, Winter Soulstice, and Spring Splash music concerts, you'll never run out of things to do on campus!

SAFETY IS OUR TOP PRIORITY

We have a 24/7, on-campus police department and emergency text notification system. At night, our community service officers patrol halls and parking lots and Campus Safety Escorts accompany students across campus.

UCR Student Recreation Center (SRC) pool and two-story gym

RIVERSIDE, CALIFORNIA

WELCOME TO RIVERSIDE: SMALL TOWN CHARM, **BIG** ON OPPORTUNITY!

The City of Riverside awaits you! Nestled just inland of Los Angeles, Riverside offers everything within reach. You can visit the mountains during the day and still make it to the beach for a night-time bonfire with friends. Riverside is full of historic gems including the world-famous Historic Mission Inn Hotel and Spa, well-known for its dazzling holiday displays, and the California Citrus Historic State Park, which pays homage to the city's citrus roots. No matter what you want to do, Riverside is at the heart of it all!

ONE HOUR OR LESS FROM CAMPUS:

Hollywood   Beaches   Mountains   Disneyland   Palm Springs   Wineries

Apple Orchards   Hot Springs   Mission Inn   Shopping   Hiking Trails

AND WITHIN DRIVING DISTANCE TO:

San Diego   San Francisco   Joshua Tree National Park   Las Vegas

Downtown Riverside at dusk

LEARN MORE

UNDERGRADUATE ADMISSIONS

900 University Avenue I Winston Chung Hall Suite 446 I Riverside, CA 92521 USA
Website: https://undergraduate.engr.ucr.edu/ I Email: undergrad@engr.ucr.edu
Phone: 951-827-5190