Bachelor of Science in Quantitative Biosciences and Engineering

Program Requirements

Student admissions to the QBE major will have the same requirements as admissions to Colorado School of Mines. There will be no additional requirements.

Program Description

The undergraduate program in Quantitative Biosciences and Engineering (QBE) is designed to provide a rigorous interdisciplinary training at the interface between biology, mathematics, computer sciences, material sciences, and chemistry, establishing a new hallmark for Colorado School of Mines. The students in the major will complete a program that includes the general Mines core, plus a set of required courses in biological sciences and data sciences along with an approved selection of biology electives. Electives are designed to support students with an interest in particular areas of biology (e.g., medicine, ecology, geobiology, systems biology, or molecular biology) along with critical quantitative and computational skills. Hands-on lab skill development and research opportunities through course-based research, undergraduate research, and independent study credit will be offered in partnership with several Mines research labs and/or corporate internships and co-ops. The curriculum will also focus on the entrepreneurial applications of biological discovery as well as the ethical, societal, and environmental concerns presented by modern biological advances.

QBE Program Level Learning Outcomes

At the end of the QBE curriculum, students should be able to:

1. Explain and apply foundational biological concepts in the areas of 1) evolution, 2) structure-function relationships, 3) biological networks and systems, 4) information storage and transfer, and 5) transformations of energy and matter.
2. Explain and apply core skills and concepts in mathematical, physical, and data sciences including basic programming, working with biological datasets, modeling biological processes, and visualizing data
3. Conduct rigorous experimental biological research through hypothesis testing, experimental design, use of research equipment, data collection, data analysis, and written and oral communication of results to diverse audiences.
4. Work in diverse teams using technical expertise, multidisciplinary skills, effective communication, and entrepreneurship to establish goals, plan tasks, and solve problems.
5. Evaluate the ethical and cultural impacts of modern biology and data science on local communities, worldwide society, and the environment.
6. Obtain a position in quantitative biosciences in industry, government, or graduate/professional school.

Admission Requirements

Student admissions to the QBE major will have the same requirements as admissions to Colorado School of Mines. There will be no additional requirements.

Primary Contact

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Quantitative Biosciences and Engineering (QBE) Program
https://qbe.mines.edu/
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Bachelor of Science in Quantitative Biosciences and Engineering Degree Requirements:

Biology Core Requirements

CBEN110	FUNDAMENTALS OF BIOLOGY I	
CBEN120	FUNDAMENTALS OF BIOLOGY II	
BIOL300	QUANTITATIVE BIOLOGY I	3.0
BIOL301	QUANTITATIVE BIOLOGY II	3.0
CBEN320	CELL BIOLOGY AND PHYSIOLOGY	3.0
CBEN321	GENETICS	3.0
CHGN428	BIOCHEMISTRY	3.0
CHGN431	INTRODUCTORY BIOCHEMISTRY LABORATORY	
CHGN462	MICROBIOLOGY	3.0
or CEEN460	MOLECULAR MICROBIAL ECOLOGY AND THE ENVIRONMENT	
BIOL412	ENTREPRENEURSHIP IN THE BIOLOGICAL SCIENCES	3.0
or BIOL491	QBE CAPSTONE DESIGN	
BIOL415	QUANTITATIVE BIOSCIENCES AND ENGINEERING FIELD SESSION	3.0
CSCI478	INTRODUCTION TO BIOINFORMATICS	3.0
CBEN331	GENETICS LABORATORY (GENETICS LABORATORY)	1.0

Fundamental Science and General Requirements

MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I	4.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II	4.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0
MATH225	DIFFERENTIAL EQUATIONS	3.0
MATH201	INTRODUCTION TO STATISTICS	3.0
CHGN121	PRINCIPLES OF CHEMISTRY I	4.0
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)	4.0
CHGN221	ORGANIC CHEMISTRY I	3.0
CHGN223	ORGANIC CHEMISTRY I LABORATORY	1.0
CHGN222	ORGANIC CHEMISTRY II	3.0
EBGN321	ENGINEERING ECONOMICS	3.0
EDNS151	CORNERSTONE - DESIGN I	3.0
HASS100	NATURE AND HUMAN VALUES	3.0
HASS215	FUTURES	3.0
ELECTIVE	CULTURE AND SOCIETY (CAS) Mid-Level Restricted Elective Courses	

ELECTIVE	CULTURE AND SOCIETY (CAS) 400-Level Restricted Elective Courses	
PHGN100	PHYSICS I - MECHANICS	4.0
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS	4.0
S&W	Success and Wellness (4 electives)	
CSCI128	COMPUTER SCIENCE FOR STEM	3.0
CSM101	FRESHMAN SUCCESS SEMINAR	1.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES	1.0

Free electives

9 credits of free electives. These can be used to cover prerequisites if necessary.

Technical Electives available

Technical electives with emphasis on biology-related courses, chosen from the following:

BIOL500	CELL BIOLOGY AND BIOCHEMISTRY	4.0
BIOL501	ADVANCED BIOCHEMISTRY	3.0
BIOL520	SYSTEMS BIOLOGY	3.0
CBEN304	ANATOMY AND PHYSIOLOGY	3.0
CBEN310	INTRODUCTION TO BIOMEDICAL ENGINEERING	3.0
CBEN311	NEUROSCIENCE	3.0
CBEN322	BIOLOGICAL PSYCHOLOGY	3.0
CBEN324	INTRODUCTION TO BREWING SCIENCE	3.0
CBEN411	NEUROSCIENCE, MEMORY, AND LEARNING	3.0
CBEN412	PHARMACOKINETICS	3.0
CBEN413	QUANTITATIVE HUMAN BIOLOGY	3.0
CBEN431	IMMUNOLOGY FOR ENGINEERS AND SCIENTISTS	3.0
CEEN461	FUNDAMENTALS OF ECOLOGY	3.0
CHGN311	INTRODUCTION TO NANOSCIENCE AND NANOTECHNOLOGY	
CHGN409	BIOLOGICAL INORGANIC CHEMISTRY	3.0
CHGN429	BIOCHEMISTRY II	3.0
CHGN435	PHYSICAL BIOCHEMISTRY	3.0
CHGN441	THE CHEMISTRY AND BIOCHEMISTRY OF PHARMACEUTICALS	3.0
CHGN445	CHEMICAL BIOLOGY	3.0
CSCI220	DATA STRUCTURES AND ALGORITHMS	3.0
CSCI404	ARTIFICIAL INTELLIGENCE	3.0
CSCI470	INTRODUCTION TO MACHINE LEARNING	3.0
DSCI403	INTRODUCTION TO DATA SCIENCE	3.0
MATH332	LINEAR ALGEBRA	3.0
MATH334	INTRODUCTION TO PROBABILITY	3.0
MATH431	MATHEMATICAL BIOLOGY	3.0
MATH472	MATHEMATICAL AND COMPUTATIONAL NEUROSCIENCE	3.0
BIOL499	INDEPENDENT STUDIES (up to 6 credits)	

Free Technical Elective totals 28 credits

Degree Requirements: General Track

First Year

		lec	lab	sem.hrs
CBEN110	FUNDAMENTALS OF BIOLOGY I			4.0
MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I			4.0
CHGN121	PRINCIPLES OF CHEMISTRY I			4.0
EDNS151	CORNERSTONE - DESIGN I			3.0
CSM101	FRESHMAN SUCCESS SEMINAR			1.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II			4.0
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)			4.0
HASS100	NATURE AND HUMAN VALUES			3.0
S&W	SUCCESS AND WELLNESS			1.0
CBEN120	FUNDAMENTALS OF BIOLOGY II			4.0
				32.0

Sophomore

Fall		**lec**	**lab**	**sem.hrs**
CHGN221	ORGANIC CHEMISTRY I	3.0		3.0
CHGN223	ORGANIC CHEMISTRY I LABORATORY		3.0	1.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0		4.0
CSCI128	COMPUTER SCIENCE FOR STEM			3.0
PHGN100	PHYSICS I - MECHANICS			4.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES			1.0
				16.0

Spring		**lec**	**lab**	**sem.hrs**
CHGN222	ORGANIC CHEMISTRY II	3.0		3.0
MATH225	DIFFERENTIAL EQUATIONS	3.0		3.0
BIOL300	QUANTITATIVE BIOLOGY I			3.0
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS			4.0
MATH201	INTRODUCTION TO STATISTICS			3.0
				16.0

Junior

Fall		**lec**	**lab**	**sem.hrs**
CHGN428	BIOCHEMISTRY			3.0
CHGN431	INTRODUCTORY BIOCHEMISTRY LABORATORY			2.0
HASS215	FUTURES			3.0
BIOL301	QUANTITATIVE BIOLOGY II			3.0
CBEN320	CELL BIOLOGY AND PHYSIOLOGY			3.0

TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE I			3.0
				17.0
Spring		**lec**	**lab**	**sem.hrs**
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE I	3.0		3.0
CBEN321	GENETICS			4.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE II			3.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE III	3.0		3.0
CHGN462	MICROBIOLOGY or CEEN 460			3.0
				16.0
Summer		**lec**	**lab**	**sem.hrs**
BIOL415	QUANTITATIVE BIOSCIENCES AND ENGINEERING FIELD SESSION			3.0
				3.0
Senior				
Fall		**lec**	**lab**	**sem.hrs**
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE II	3.0		3.0
FREE	FREE ELECTIVE I			3.0
EBGN321	ENGINEERING ECONOMICS*For the 2023 Catalog EBGN321 replaced EBGN201 as a Core requirement. EBGN321 was added to the core, but has a prerequisite of 60 credit hours. Students whose programs that required EBGN201 the sophomore year may need to wait to take EBGN321 until their junior year. For complete details, please visit: https://www.mines.edu/registrar/core-curriculum/			3.0
BIOL412	ENTREPRENEURSHIP IN THE BIOLOGICAL SCIENCES or 491			3.0
CSCI478	INTRODUCTION TO BIOINFORMATICS			3.0
				15.0
Spring		**lec**	**lab**	**sem.hrs**
FREE	FREE ELECTIVE II			3.0
FREE	FREE ELECTIVE III			3.0
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE III			3.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE IV			3.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE V			3.0
				15.0

Total Semester Hrs: 130.0

Degree Requirements: Honors Track

First Year

		lec	lab	sem.hrs
CBEN110	FUNDAMENTALS OF BIOLOGY I			4.0
MATH111	CALCULUS FOR SCIENTISTS AND ENGINEERS I			4.0
CHGN121	PRINCIPLES OF CHEMISTRY I			4.0
EDNS151	CORNERSTONE - DESIGN I			3.0
CSM101	FRESHMAN SUCCESS SEMINAR			1.0
MATH112	CALCULUS FOR SCIENTISTS AND ENGINEERS II			4.0
CHGN122	PRINCIPLES OF CHEMISTRY II (SC1)			4.0
HASS100	NATURE AND HUMAN VALUES			3.0
S&W	SUCCESS AND WELLNESS			1.0
CBEN120	FUNDAMENTALS OF BIOLOGY II			4.0
				32.0
Sophomore				
Fall		**lec**	**lab**	**sem.hrs**
CHGN221	ORGANIC CHEMISTRY I	3.0		3.0
CHGN223	ORGANIC CHEMISTRY I LABORATORY		3.0	1.0
MATH213	CALCULUS FOR SCIENTISTS AND ENGINEERS III	4.0		4.0
CSCI128	COMPUTER SCIENCE FOR STEM			3.0
PHGN100	PHYSICS I - MECHANICS			4.0
CSM202	INTRODUCTION TO STUDENT WELL-BEING AT MINES			1.0
				16.0
Spring		**lec**	**lab**	**sem.hrs**
CHGN222	ORGANIC CHEMISTRY II	3.0		3.0
MATH225	DIFFERENTIAL EQUATIONS	3.0		3.0
BIOL300	QUANTITATIVE BIOLOGY I			3.0
PHGN200	PHYSICS II-ELECTROMAGNETISM AND OPTICS			4.0
MATH201	INTRODUCTION TO STATISTICS			3.0
HNRS398	SPECIAL TOPICS IN THE UNIVERSITY HONORS AND SCHOLARS PROGRAM (Research Methods)			1.0
				17.0

Junior				
Fall		**lec**	**lab**	**sem.hrs**
CHGN428	BIOCHEMISTRY			3.0
CHGN431	INTRODUCTORY BIOCHEMISTRY LABORATORY			2.0
HASS215	FUTURES			3.0
BIOL301	QUANTITATIVE BIOLOGY II			3.0
CBEN320	CELL BIOLOGY AND PHYSIOLOGY			3.0
BIOL499	INDEPENDENT STUDY (Honors Research)			3.0
				17.0
Spring		**lec**	**lab**	**sem.hrs**
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE I	3.0		3.0
CBEN321	GENETICS			4.0
CHGN462	MICROBIOLOGY or CEEN 460			3.0
BIOL499	INDEPENDENT STUDY (Honors Research)			3.0
BIOL490	QUANTITATIVE BIOSCIENCES & ENGINEERING UNDERGRADUATE SEMINAR (QBE Seminar)			1.0
				14.0
Summer		**lec**	**lab**	**sem.hrs**
BIOL415	QUANTITATIVE BIOSCIENCES AND ENGINEERING FIELD SESSION			3.0
				3.0
Senior				
Fall		**lec**	**lab**	**sem.hrs**
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE II	3.0		3.0
FREE	FREE ELECTIVE I			3.0
EBGN321	ENGINEERING ECONOMICS*For the 2023 Catalog EBGN321 replaced EBGN201 as a Core requirement. EBGN321 was added to the core, but has a prerequisite of 60 credit hours. Students whose programs that required EBGN201 the sophomore year may need to wait to take EBGN321 until their junior year. For complete details, please visit: https://www.mines.edu/registrar/core-curriculum/			3.0
BIOL412	ENTREPRENEURSHIP IN THE BIOLOGICAL SCIENCES or 491			3.0
CSCI478	INTRODUCTION TO BIOINFORMATICS			3.0
HNRS498	SPECIAL TOPICS (Research Communications)			1.0
				16.0
Spring		**lec**	**lab**	**sem.hrs**
FREE	FREE ELECTIVE II			3.0
FREE	FREE ELECTIVE III			3.0
ELECTIVE	CULTURE AND SOCIETY (CAS) RESTRICTED ELECTIVE III			3.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE I			3.0
TECH	TECH ELECTIVE INTERDISCIPLINARY BIO TECHNICAL ELECTIVE II			3.0
				15.0

Total Semester Hrs: 130.0

* Signifies a new course needed for major degree offering.

COURSES

BIOL300. QUANTITATIVE BIOLOGY I. 3.0 Semester Hrs.
This 3-credit course is designed as an introductory course for Quantitative Biosciences and Engineering (QBE) majors, providing them with the foundational skills needed to be a biologist, bioengineer, or medical doctor in the 21st century. Since biological data and questions are becoming more quantitative and more precise in nature, so must our approaches to our analysis. Accordingly, this course will explore the basics of how to access and analyze existing various types biological data across a wide range of biological scales including sequencing data at the molecular scale, microscopy data at the cellular and organismal scale, and tabular data at the ecological scale. From this data, students will learn to conduct fundamental data analysis and produce appropriate visualizations to illustrate their interpretations of the key results. Prerequisite: CBEN120, CSCI128. Co-requisite: MATH201.
Course Learning Outcomes

- Access and organize existing biological data sets
- Produce plots and visualizations of biological data sets
- Develop, write, and implement code in Python#to analyze data in a#biological context
- Implement functions in#Python to simulate and gain insight into biological processes
- Conduct null hypothesis significance testing with respect to biological problems
- Identify probability distributions as they appear in and apply to biological processes
- Conduct linear regression on biological data

BIOL301. QUANTITATIVE BIOLOGY II. 3.0 Semester Hrs.
This course will extend the applications of quantitative biology, building from the foundation in biological data analysis established in BIOL300. Students will learn how to model biological systems both mathematically and computationally and ultimately compare model predictions to experimental data. Mathematical modeling will involve developing and solving differential equations to describe biological processes. Computational modeling will involve writing Python code to simulate various biological processes to gain insights into their behavior. Lastly,

as a boarder type of modeling, students will explore biological sequences and genomes to develop both phylogenetic and metabolic models of organisms. Prerequisites: BIOL300, MATH225.

Course Learning Outcomes

- Develop differential equations to model biological systems at different scales (e.g. molecular, cellular, populations) Solve simple differential equations analytically for steady state, and explain the biological implications Solve complex differential equations computationally and plot dynamics to gain insight into biological processes Create code to stochastically and deterministically simulate biological processes Compare predictions from computational and mathematical models with results from experimental data Analyzing biological sequences to develop phylogenetic models of how organisms evolved Analyze genome sequences for metabolic properties and pathway development

BIOL410. ENTREPRENEURSHIP IN THE BIOLOGICAL SCIENCES SEMINAR. 1.0 Semester Hr.

This 1-credit course provides QBE majors with a snapshot of the fundamentals of entrepreneurship, with a particular focus on biomedical technologies.What is an entrepreneur? What does it take to be an entrepreneur? This course will provide a snapshot of the fundamentals of entrepreneurship, with a particular focus on biomedical technologies. Learn how novel technologies can be taken from bench to bedside, and all the considerations that must go into this type of technology translation. Whether or not you ever start your own company, or work for a startup, the topics that you are asked to think about as part of this course will help you in any future career as you deepen your understanding of technology-driven business. Think, act, innovate, and deliver like an entrepreneur. Prerequisites: BIOL301.

Course Learning Outcomes

- Describe the issues facing entrepreneurs when starting a venture.
- Lay out the building blocks required for starting a company.
- Effectively gather information about the market and competitive landscape.
- Describe the importance of intellectual property and quality systems.
- Evaluate FDA regulatory pathways for various types of biomedical products.
- Effectively conduct customer discovery through interviews and data collection.
- Evaluate new venture opportunities.
- Deliver an effective pitch presentation.

BIOL412. ENTREPRENEURSHIP IN THE BIOLOGICAL SCIENCES. 3.0 Semester Hrs.

What is an entrepreneur? What does it take to be an entrepreneur? This course will provide a snapshot of the fundamentals of entrepreneurship, with a particular focus on biomedical technologies. Learn how novel technologies can be taken from bench to bedside, and all the considerations that must go into this type of technology translation. Whether or not you ever start your own company, or work for a startup, the topics that you are asked to think about as part of this course will help you in any future career as you deepen your understanding of technology-driven business. Think, act, innovate, and deliver like an entrepreneur. Prerequisites: BIOL301.

Course Learning Outcomes

- Describe the issues facing entrepreneurs when starting a venture.
- Lay out the building blocks required for starting a company.
- Effectively gather information about the market and competitive landscape.
- Describe the importance of intellectual property and quality systems.
- Evaluate FDA regulatory pathways for various types of biomedical products.
- Effectively conduct customer discovery through interviews and data collection.
- Evaluate new venture opportunities.
- Deliver an effective pitch presentation.

BIOL415. QUANTITATIVE BIOSCIENCES AND ENGINEERING FIELD SESSION. 3.0 Semester Hrs.

In this course students will apply all they have learned in QBE courses to date to tackle large projects that have important societal, environmental, energy, and health impacts. Projects will include hands-on collection and analysis of field samples and modern molecular biology and biochemistry laboratory work. Students will need to use their molecular biology, biochemistry, experimental, data analysis, and computational skills to succeed in this course, which will ultimately prepare students for the next steps in their QBE and professional careers. Prerequisite: BIOL301, CHGN431.

Course Learning Outcomes

- 1. Explain and apply foundational biological concepts in the areas of molecular biology and biochemistry to solve novel problems related to genomic microbial exploration and recombinant protein production
- 2. Explain and apply core skills and concepts in mathematical, physical, and data sciences including basic programming, working with biological datasets, modeling biological processes, and visualizing data
- 3. Conduct rigorous experimental biological research through hypothesis testing, experimental design, use of research equipment, data collection, data analysis, and statistical analysis
- 4. Communicate your progress and results through written reports and oral presentations to diverse audiences
- 5. Work in diverse teams using multidisciplinary skills and effective communication to establish goals, plan tasks, and solve problems
- 6. Evaluate the ethical and cultural impacts of genomic microbial exploration and recombinant protein production on local communities, worldwide society, and the environment

BIOL490. QUANTITATIVE BIOSCIENCES & ENGINEERING UNDERGRADUATE SEMINAR. 1.0 Semester Hr.

The Quantitative Biosciences and Engineering (QBE) Undergraduate Seminar provides a forum for QBE undergraduate students to participate in seminars given by QBE professionals, develop an enhanced understanding of the breadth of quantitative bioscience disciplines, and present their research projects. Grade is based on attendance over the semester. Prerequisites: BIOL300.

Course Learning Outcomes

- Exposure to ongoing work by QBE professionals.
- Develop an enhanced understanding of the breadth of quantitative bioscience disciplines.
- Exposure to new and innovative research methodologies in the quantitative biosciences.

BIOL491. QBE CAPSTONE DESIGN. 3.0 Semester Hrs.

Apply your knowledge of bioscience to a real-life engineering problem in this capstone design course dedicated to QBE majors. You will develop

the ability to break large problems down into discrete tasks and explain complex ideas clearly and convincingly. Project teams will plan, test, model, and prepare a final design while considering economic and bioethical aspects of their design process. The design process will involve interviewing stakeholders, analyzing the state of current solutions, experimental methods, and presenting results in written and spoken form. Towards the end of the semester, your group will submit a final product report and pitch a product that solves your design problem to peers, professors, clients, and industry stakeholders. Options include a physical prototype, a detailed experimental protocol, or a software tool. QBE Capstone Design offers an open-ended design experience that will develop your problem-solving skills and advance your long-term career goals. Prerequisites: EDNS151. Co-requisites: Senior or graduate standing in QBE, BIOL301.

Course Learning Outcomes

- Design a device, program, or procedure using the iterative engineering design process.
- Manage a project by setting deadlines and conducting update meetings with group members, clients, and the professor.
- Develop a design test plan that leverages existing resources on campus and in the greater community.
- Integrate universal design concepts, ethical considerations, and regulatory criteria into product decisions, documentation, and presentations.
- Judge the feasibility and value of stakeholder feedback through surveys, interviews, product demonstrations, and testing.
- Incorporate relevant feedback from a diverse group of stakeholders (including designers, manufacturers, and end-users) in the design process.
- Predict product applications by comparing alternate use cases and future development of the professional field.

Program Faculty

Joel Bach, Emeritus Associate Professor of Mechanical Engineering

Linda Battalora, Teaching Professor of Petroleum Engineering

Parisa Bazazi, Assistant Professor of Petroleum Engineering

Suzannah Beeler, Associate Director of the QBE Undergraduate Program and Teaching Associate Professor of Chemical and Biological Engineering

Cecilia Diniz Behn, Professor of Applied Mathematics & Statistics

Christian Beren, Director of the QBE Undergraduate Program and Teaching Associate Professor of Chemistry

Nanette Boyle, Professor of Chemical and Biological Engineering

Kevin Cash, Director of the QBE Graduate Program and Associate Professor of Chemical and Biological Engineering

Anuj Chauhan, Professor of Chemical and Biological Engineering

Kristine Csavina, Teaching Professor of Mechanical Engineering

Duncan Davis-Hall, Teaching Assistant Professor of Engineering, Design, & Society

Dylan Domaille, Associate Professor of Chemistry

Linda Figueroa, Professor of Civil and Environmental Engineering

Alina Handorean, Teaching Professor of Engineering, Design & Society

Christopher Higgins, Professor of Civil and Environmental Engineering

Jenny Ketterling, Teaching Associate Professor of Chemical and Biological Engineering

Katie Knaus, Assistant Professor of Mechanical Engineering

Melissa Krebs, Associate Professor of Chemical and Biological Engineering

Ramya Kumar, Assistant Professor of Chemical and Biological Engineering

Terry Lowe, Research Professor of Materials and Metallurgical Engineering

David Marr, Professor of Chemical and Biological Engineering

Junko Munakata Marr, Professor of Civil and Environmental Engineering

Alexander Pak, Assistant Professor, Chemical and Biological Engineering

Steve Pankavich, Professor of Applied Mathematics & Statistics

Anthony Petrella, Associate Professor of Mechanical Engineering

Yamuna Phal , Assistant Professor of Electrical Engineering

Matthew Posewitz, Professor of Chemistry

Josh Ramey, Teaching Professor of Chemical and Biological Engineering

James Ranville, Professor of Chemistry

Justin Shaffer, Associate Dean of Undergraduate Students and Teaching Professor of Chemical and Biological Engineering

Jonathan Sharp, Professor of Civil and Environmental Engineering

Anne Silverman, Professor of Mechanical Engineering

E. Dendy Sloan, Emeritus Professor of Chemical and Biological Engineering

John Spear, Professor, Civil and Environmental Engineering

Jeff Squier, Professor of Physics

Amadeu Sum, Professor of Chemical and Biological Engineering

Brian Trewyn, Professor of Chemistry

Shubham Vyas, Professor of Chemistry

Xiaoli Zhang, Professor of Mechanical Engineering