

A. James Clark School of Engineering (ENGR)

Engineering

Upper Division Certificate - Science, Technology and Society

- Develop Critical Thinking Skills for Understanding Contemporary Issues in Engineering
- Oral Communication, Mentoring, Teaching and Leadership Skills
- Career Preparation through the Development of Engineering Solutions in a Global and Social Context

Department of Aerospace Engineering

Bachelor's - Aerospace Engineering

- Ability to apply knowledge of mathematics
- Ability to apply knowledge of basic science (chemistry, physics)
- Ability to apply knowledge of engineering principles
- Ability to use computers to solve engineering problems
- Ability to identify, formulate, and solve engineering problems
- Ability to design and conduct experiments
- Ability to analyze and interpret data
- Ability to design a component, system, or process to meet desired needs under realistic constraints
- Ability to use the techniques, skills, and tools of modern engineering practice
- Ability to write effectively
- Ability to speak effectively
- Ability to function effectively as part of a multidisciplinary team
- Understanding of professional and ethical responsibility
- Knowledge of contemporary issues in engineering
- Understanding of the impact of engineering solutions in a global, societal, environmental, and economic context
- Awareness of the need to continually upgrade one's technical knowledge base and skills, and the ability to do so

Department of Bioengineering

Bachelor's - Bioengineering

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- 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
- An ability to function on multidisciplinary teams
- An ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- An ability to communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- A recognition of the need for, and an ability to engage in lifelong learning

- A knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- An ability to perform measurements on and to interpret data from living systems
- Background knowledge to support understanding of interactions between living and non-living materials and systems.
- An ability to apply statistics to bioengineering applications

Department of Civil and Environmental Engineering

Bachelor's - Civil Engineering

- An ability to design a component, system or process to meet desired needs
- An ability to design & conduct experiments
- An ability to identify, formulate, and solve engineering problems
- An understanding of the impact of engineering solutions in a global and society context.
- An ability to apply knowledge of engineering principles.

Department of Chemical & Biomolecular Engineering

Bachelor's - Chemical and Biological Engineering

- An ability to apply knowledge of mathematics, science, and fundamental engineering principles
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a chemical product or process to meet designated specifications
- An ability to function on teams
- An ability to identify, formulate, and solve chemical engineering problems
- An understanding of professional and ethical responsibility, particularly with respect to process safety
- An ability to communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global and societal context
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues and applications of chemical engineering
- An ability to use the techniques, skills, and modern engineering tools for engineering practice

Electrical and Computer Engineering

Bachelor's - Computer Engineering

- Ability to design systems, components, or processes to meet specific needs
- Ability to design and conduct experiments, as well as analyze and interpret data
- Ability to apply core electrical engineering technical knowledge
- Ability to communicate effectively
- Ability to recognize the need for and ability to engage in life-long learning

Bachelor's - Electrical Engineering

- Ability to design systems, components, or processes to meet specific needs

- Ability to design and conduct experiments, as well as analyze and interpret data
- Ability to apply core electrical engineering technical knowledge
- Ability to communicate effectively
- Ability to recognize the need for and ability to engage in life-long learning

Department of Fire Protection Engineering

Bachelor's - Fire Protection Engineering

- Demonstrated ability to apply knowledge of math, engineering and science in identifying, formulating and solving engineering problems representative of those commonly encountered in the fire protection engineering practice making use of modern techniques, skills and engineering tools available in the professional practice
- Demonstrated ability to design systems, processes and components relevant to the fire protection engineering practice or enhancing the performance and safety of the fire service personnel as well as experimental apparatus, experimental procedures and data analysis generating novel information and knowledge in fire science and fire protection engineering
- Demonstrated ability to perform in multi-disciplinary or multi-tasking teams and to communicate effectively through written reports and technical presentations with fire protection engineers and with other relevant professional constituencies (AHJ, architectural firms, etc.)
- Demonstrated knowledge of contemporary issues relevant to the fire protection engineering profession and broad understanding of the relevant societal issues impacted by the engineering solutions as well as the professional and ethical responsibilities associated with the practice of fire protection engineering. Recognize the need for engaging in life-long learning and ability to maintain state of the art fire protection engineering knowledge and skills

Department of Materials Science and Engineering

Bachelor's - Materials Science and Engineering

- Ability to apply mathematics, science and engineering principles.
- Ability to design and conduct experiments, analyze and interpret data.
- Ability to design a system, component, or process to meet desired needs.
- Ability to function on multidisciplinary teams.
- Ability to identify, formulate and solve engineering problems.
- Understanding of professional and ethical responsibility.
- Ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- Recognition of the need for and an ability to engage in life-long learning.
- Knowledge of contemporary issues.
- Ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

Department of Mechanical Engineering

Bachelor's - Mechanical Engineering

- an ability to apply knowledge of mathematics, science, and engineering:
- an ability to design and conduct experiments, as well as to analyze and interpret data
- 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

- an ability to function on multidisciplinary teams
- an ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibility
- an ability to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- a recognition of the need for, and an ability to engage in life-long learning
- a knowledge of contemporary issues
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- an ability to work professionally in both thermal and mechanical systems areas