



Division of Energy and Innovation  
UNIVERSITY OF HOUSTON



# EDUCATIONAL PROGRAMS IN *ENERGY*

A COMPREHENSIVE GUIDE-  
BOOK OF ENERGY-RELATED  
ACADEMIC PROGRAMS

**2024-2025**





# WHAT'S IN *THIS ISSUE*







## 07 **Message from the Vice President**

Dr. Ramanan Krishnamoorti shares his knowledge on collaborative and discipline-centered education programs.

## 08 **About The Division**

Meet the team and discover how you can be a part of “The Energy University.”

## 10 **Energy Sectors & Related Careers**

Learn more about the four major energy sectors, upstream; midstream and downstream; alternatives and enablers, and policy and management.

## 12 **UHin4**

The UHin4 program provides a comprehensive plan to help students navigate their four-year college experience.

## 14 **Undergraduate Programs**

Peruse undergraduate majors and minors across eight colleges. Strengthen your expertise in the world of energy.

## 63 **Graduate & Professional Programs**

Continue your education and discover opportunities for research, scholarships and professional studies.

## 116 **Micro-Credentialing Programs**

Badge programs offered to upperclassmen and energy professionals to develop new skillsets and boost resumes.

## 119 **Student Resources**

Schedule a campus visit, locate an admissions counselor, and request more information on specific programs.

## 121 **How to Apply**

Learn more about how you can apply to the University of Houston as an incoming freshman, graduate, international or transfer student.



# *In-Depth TOC*

I.E. a detailed list of what's within each section. I.E. Colleges, Micro-credential courses, etc.



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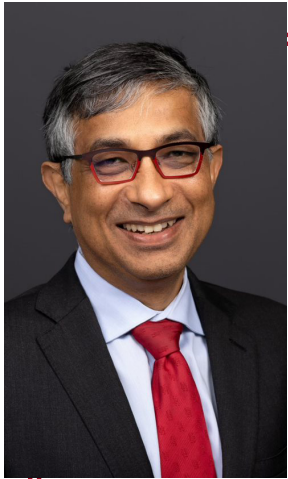




# THE ENERGY UNIVERSITY

# WELCOME

Message from the Vice President of Energy & Innovation



TBA  
Words.

A handwritten signature in black ink, appearing to read 'Ramanan'.

Ramanan Krishnamoorti  
Vice President, Energy & Innovation  
University of Houston

## UH ENERGY & INNOVATION AT A GLANCE

30

Energy-related  
Undergraduate Programs

11

Energy-related  
Graduate Certificates

46

Energy-related Graduate  
& Professional Programs

29

Research Centers

1ST

In the Nation Subsea  
Engineering Master's  
Program

# ABOUT THE DIVISION

## MISSION

UH Energy is an umbrella for efforts across the University of Houston system to position the university as a strategic partner to the energy industry by producing trained workforce, strategic and technical leadership, research and development for needed innovations and new technologies.

That's why UH is the Energy University.

## STAY CONNECTED



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[www.uh.edu/energy](http://www.uh.edu/energy)

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# MEET THE TEAM

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### EXECUTIVE DIRECTOR OF THE ROICE PROJECT

Ram Seetharam

### COMMUNICATIONS DIRECTOR

Ed Bailey

### COMMUNICATIONS COORDINATOR

Mia Brooks

### CONTRIBUTING COLLEGES

Gerald D. Hines College of Architecture  
C. T. Bauer College of Business  
Cullen College of Engineering  
The Honors College  
College of Liberal Arts and Social Sciences  
College of Natural Sciences and  
Mathematics  
College of Technology  
UH Law Center  
Hobby School of Public Affairs



# LAUNCH YOUR EDUCATION FUEL YOUR CAREER

UH offers several innovative educational programs at all levels and in the four major energy sectors: upstream; midstream and downstream; alternatives and enablers; and policy and management. UH also offers continuing professional studies, as well as certificate programs that may be completed either in conjunction with a graduate level degree or as a stand-alone. Most degree and certificate programs listed in this guidebook only include a subset of degree plan requirements. For more information on individual degree and certificate programs, visit the corresponding departmental websites indicated on each program page or see 'Student Resources' for information on how and where you can access the official University of Houston undergraduate and graduate catalogs online.

## ***UPSTREAM***

The upstream energy sector involves exploration and production of oil and gas, including underwater or underground crude oil, natural gas fields and drilling wells. Professionals in this sector include geologists and geophysicists, who determine where resources can be found; petroleum engineers, who work with geoscientists to understand geologic formations, and mechanical engineers, who optimize physics and materials science to design, examine and manufacture mechanical systems.

## ***MIDSTREAM & DOWNSTREAM***

Midstream involves bringing oil and gas to the distributor and the conversion and storage of these natural resources. This includes the construction, maintenance and operation of pipelines, rail cars, barges and ships, and other modes of transporting energy resources. Refining crude oil and processing natural gas, production of value added materials and consumer products and marketing occupy the downstream sector of the energy industry.

## ***ALTERNATIVES/ENABLERS***

As energy demands become more dynamic, innovative researchers and problem solvers will lead the ever-changing energy industry. Various types of engineering, from chemical to industrial, will have a role in the future. At UH, we believe that the world's energy demand and environmental stewardship go hand-in-hand. We exemplify this through our popular undergraduate minor in Energy and Sustainability and the globally recognized Energy, Environment and Natural Resource Law program in the UH Law Center. UH has programs in sustainable, innovative and new architecture, electric grid cyber security, environmental engineering, power engineering, power technology and superconductivity.

## ***POLICY/MANAGEMENT***

Public policy, regulatory, financial, business, policy and management issues are central to the implementation of energy programs. To address this, UH offers programs on energy management, energy finance, public policy, energy law and industrial psychology. Noteworthy are the Gutierrez Energy Management Institute (GEMI), and the Upstream Energy Safety Certification Program that have a global focus. One of our newest programs in this area is the graduate certificate program in Global Energy, Development and Sustainability.

# ***FRESHMAN FOUR YEAR GRADUATION PLAN***

The University of Houston is committed to creating an educational environment in which student success can be ensured. The UHin4 program was created to simplify the process for students to earn both a high quality and affordable education. In support of this goal, we strive to provide students with tools and resources needed to facilitate degree completion. This graduation plan has been developed as a mechanism to help students identify and pursue clear paths for completing their undergraduate degree in a timely manner. Graduation within four academic years of initial fall enrollment at the University of Houston is ensured conditioned upon the satisfaction of student eligibility requirements, which can be found on the UHin4 website.

## ***ACADEMIC MAPS***

The academic maps serve as a guideline for planning courses along your journey to a four-year graduation. Students should meet with their academic advisors regularly to confirm their official degree plans to ensure applicable course selection and sequencing. Only undergraduate programs that naturally fall under a four year curriculum will contain a corresponding academic map.

**To access the full list of academic maps: [uh.edu/UHin4](https://uh.edu/UHin4)**

## ***ENROLLMENT***

To participate in UHin4, students must enroll at the University for the first time as a freshman during the summer or fall semester, be admitted to an eligible major or as an undeclared student at the time of enrollment, and enroll in at least 15 semester credit hours at the University of Houston in the fall semester.

**How to sign up for UHin4: [uh.edu/UHin4/#sign-up](https://uh.edu/UHin4/#sign-up)**







# **UNDERGRADUATE** ***PROGRAMS***



# GERALD D. HINES

## College of Architecture and Design

The Gerald D. Hines College of Architecture and Design offers its students a platform of integrated disciplines—Architecture, Interior Architecture, and Industrial Design—from which to negotiate the complexities of contemporary practice in a world that is grappling with diminishing economic and natural resources; the realities of post disaster reconstruction; and at the same time, continued, rapid urbanization.

Faculty and students work together in a studio-centric curriculum, supported by a digital fabrication facility. Open studios seamlessly incorporate coursework into project based learning through material investigations and applied research.

The College of Architecture and Design is a member of the Association of Collegiate Schools of Architecture (ACSA) and is accredited by the National Architectural Accrediting Board (NAAB).



# ARCHITECTURE

## BArch

The Gerald D. Hines College of Architecture and Design offers a Bachelor of Architecture, enabling students to pursue licensure after completing degree requirements. The Bachelor of Architecture is a five-year professional degree. Design is the focus of undergraduate studies and provides students with access to resources involving research, building, and community components. Students gain hands-on experience in studio courses with guidance from experienced faculty.

The degree plan is structured to immerse students in a focused education that will build their skills to be top leaders and innovators in the field of architecture. The program for the Bachelor of Architecture degree (first professional degree) is a five-year curriculum of at least 160 semester credit hours. The focus of the curriculum is preparation for professional practice in architecture and emphasizes sustainability, critical thinking, research, and technology. The curriculum is divided into four segments: Foundation Level, Intermediate Level, Comprehensive Design, and Professional Level.

## Degree Requirements: 160 semester hours

### FOUNDATION COURSES

**ARCH 1358** Introduction to Design Culture  
**ARCH 1500** Design Studio I  
**ARCH 1501** Design Studio II  
**ARCH 1210** History and Theory of Design Media  
**ARCH 2327** Technology I  
**ARCH 2350** Survey of Architectural History I  
**MATH 1310** College Algebra  
**MATH 1330** Precalculus  
**PHYS 1301** Introductory General Physics I  
**PHYS 1302** Introductory General Physics II

### INTERMEDIATE COURSES

**ARCH 2501** Architecture Design Studio IV  
**ARCH 2351** Survey of Architectural History II  
**ARCH 2328** Technology II  
**ARCH 3500** Architecture Design Studio V  
**ARCH 3327** Technology III  
**ARCH 3501** Architecture Design Studio IV  
**ARCH 3328** Technology IV  
**ARCH 3230** Programming and Building Regulations

### COMPREHENSIVE DESIGN

**ARCH 4510** Integrated Architectural Solutions  
**ARCH 4373** Urban Environments  
**ARCH 4327** Technology V

### PROFESSIONAL

**ARCH 5500** Architecture Design Studio VIII  
**ARCH 4328** Technology VI  
**ARCH 5500** Architecture Design Studio IX  
**ARCH 5500** Architecture Design Studio X  
Approved Architecture Research **Elective**

### ELECTIVE COURSES

**6 credit hours** Architectural History electives  
**6 credit hours** Architecture electives  
**6 credit hours** approved integrative courses  
**15 credit hours** general electives

#### **3 credit hours of approved electives, selected from the following:**

**ACCT 2331** Account Principles I  
**ARTH 1380** Art & Society: Prehistoric to Gothic  
**ARTH 1381** Art & Society: Renaissance to Modern  
**ARTH 2389** Modern & Contemporary Art  
**COMM 1332** Fundamentals of Public Speaking  
**ENRG 3310** Introduction to Energy & Sustainability  
**ENTR 3310** Entrepreneurship  
**GENB 3300** Introduction to Personal Finance  
**HDGS 1300** Human Ecosystems and Technological Change  
**HDGS 3300** Organizational Decisions  
**MUSI 3300** Listening to Music Masterworks

# INTERIOR ARCHITECTURE BS

The Bachelor of Science in Interior Architecture degree is a four-year program focusing on the design of architectural interiors with particular focus on sustainability, materiality, color theory, lighting, and the social and cultural aspects of habitable space. Design is the focus of undergraduate studies and provides students with access to resources involving research, building and community components. Students gain hands-on experience in studio courses with guidance from experienced faculty.

Degree Requirements: **132**  
semester hours

## FOUNDATION COURSES

**ARCH 1358** Introduction to Design Culture  
**ARCH 1500** Design Studio I  
**ARCH 1210** History and Theory of Design Media  
**ARCH 1501** Design Studio II  
**ARCH 2500** Architecture Design Studio III  
**ARCH 2327** Technology I  
**ARCH 2350** Survey of Architectural History I  
**MATH 1310** College Algebra  
**MATH 1330** Precalculus  
**PHYS 1301** Introductory General Physics I  
**PHYS 1302** Introductory General Physics II

## INTERMEDIATE COURSES

**ARCH 2351** Survey of Architectural History II  
**ARCH 2328** Technology II  
**ARCH 3230** Programming and Building Regulations  
**INAR 2501** Interior Architecture Design Studio IV  
**INAR 3360** Human Factors  
**INAR 3300** History of Interior Architecture  
**INAR 3500** Interior Architecture Design Studio V

## PROFESSIONAL

**INAR 3501** Interior Architecture Design Studio VI  
**INAR 3310** Materials and Methods  
**INAR 4500** Interior Architecture Design Studio VII  
**INAR 4393** Interior Architecture Thesis Preparation  
**INAR 4501** Interior Architecture Design Studio VIII  
**INAR 4360** Practice of Interior Architecture

## ELECTIVE COURSES

**6 credit hours** approved integrative courses  
**6 credit hours** general electives

**7 credit hours of approved electives, selected from the following:**

**ACCT 2331** Account Principles I  
**ARTH 1380** Art & Society: Prehistoric to Gothic  
**ARTH 1381** Art & Society: Renaissance to Modern  
**ARTH 2389** Modern & Contemporary Art  
**IART 3395** Spatial Activism: Houston  
**COMM 1332** Fundamentals of Public Speaking  
**ENRG 3310** Intro to Energy & Sustainability  
**ENTR 3310** Entrepreneurship  
**GENB 3300** Introduction to Personal Finance  
**HDCS 1300** Human Ecosystems & Technological Change  
**HDCS 3300** Organizational Decisions  
**MUSI 3300** Listening to Music Masterworks





# INDUSTRIAL DESIGN BS

Established in 2003, the Bachelor of Science in Industrial Design is the first of its kind in a four-state region covering Texas, Oklahoma, Arkansas, and New Mexico.

The Industrial Design (ID) program emerged from an established and respected university in one of the largest and most dynamic urban centers: Houston. The city provides an ideal learning context for the discipline of Industrial Design with resources unique to the metro area, such as NASA, the Texas Medical Center and diverse industrial entities.

The education model for the Industrial Design program focuses on addressing a new structure of learning by connecting and integrating design knowledge in innovative, useful, and meaningful ways for the student. The ID program emphasizes the learner's generative and discovery-oriented learning process through integrated, collaborative, and project-oriented learning.

Degree Requirements: **132**  
semester hours



**INDS 1501** Industrial Design Studio II  
**INDS 2500** Industrial Design Studio III  
**INDS 2340** Visual Communication  
**INDS 2355** Design History I  
**INDS 2260** Materials and Fabrication Methods  
**INDS 2160** Materials and Fabrication Methods II  
**INDS 2501** Industrial Design Studio IV  
**INDS 2341** Computer-Aided Industrial Design I  
**INDS 2356** Design History II  
**INDS 3500** Industrial Design Studio V  
**INDS 3340** Computer Aided Industrial Design II  
**INDS 3360** Human Factors  
**INDS 3501** Industrial Design Studio VI  
**INDS 3341** Design Interaction  
**INDS 3365** Design Research Methods  
**INDS 4380** Design Internship  
**INDS 4500** Industrial Design Studio VII  
**INDS 4360** Design Issues  
**INDS 4501** Industrial Design Studio VIII  
**INDS 4365** Design Practice and Business  
**ARCH 1200** Introduction to Architecture, Industrial Design, and Interior Architecture  
**ARCH 1500** Architecture Design Studio I  
**ARCH 1358** Introduction to Design Culture  
**MATH 1310** College Algebra  
**MATH 1330** Precalculus  
**PHYS 1301** Introductory General Physics I  
**PHYS 1302** Introductory General Physics II

## ELECTIVE COURSES

**3 credit hours** general electives

**6 credit hours approved electives, selected from the following:**

**ACCT 2331** Account Principles I  
**ARTH 1380** Art & Society: Prehistoric to Gothic  
**ARTH 1381** Art & Society: Renaissance to Modern  
**ARTH 2389** Modern & Contemporary Art  
**IART 3395** Selected Topics in Interdisciplinary Arts  
**ENRG 3310** Intro to Energy & Sustainability  
**ENTR 3310** Entrepreneurship  
**GENB 3300** Introduction to Personal Finance  
**HDCS 1300** Human Ecosystems & Technological Change  
**HDCS 3300** Organizational Decisions  
**MUSI 3300** Listening to Music Masterworks

# ENVIRONMENTAL DESIGN BS

The program for the Bachelor of Science in Environmental Design degree is a pre-professional, four-year curriculum of at least 128 semester hours. The curriculum includes 73 hours of Architecture courses, 34 of which are advanced hours (3000-level or higher). The degree includes the university's required core curriculum and 4 semester hours of elective courses, and maintains the same focus as the Bachelor of Architecture, but with less emphasis on professional practice.

Degree Requirements: **128**  
semester hours

## FOUNDATION COURSES

**ARCH 1358** Introduction to Design Culture  
**ARCH 1500** Architecture Design Studio I  
**ARCH 1210** History and Theory of Design Media  
**ARCH 1501** Architecture Design Studio II  
**ARCH 2500** Architecture Design Studio III  
**ARCH 2327** Technology I  
**ARCH 2350** Survey of Architectural History I  
**MATH 1310** College Algebra  
**MATH 1330** Precalculus  
**PHYS 1301** Introductory General Physics I  
**PHYS 1302** Introductory General Physics II

## INTERMEDIATE COURSES

**ARCH 2501** Architecture Design Studio IV  
**ARCH 2328** Technology II  
**ARCH 2351** Survey of Architectural History II  
**ARCH 3500** Architecture Design Studio V  
**ARCH 3327** Technology III  
**ARCH 3501** Architecture Design Studio VI  
**ARCH 3328** Technology IV  
**ARCH 3230** Programing and Building Regulations

## COMPREHENSIVE DESIGN

**ARCH 4373** Urban Environments

## ELECTIVE COURSES

**6 credit hours** Architectural History electives  
**6 credit hours** Architecture electives  
**6 credit hours** approved integrative courses  
**13 credit hours** general electives

### **6 credit hours of approved electives, selected from the following:**

**ACCT 2331** Account Principles I  
**ARTH 1380** Art & Society: Prehistoric to Gothic  
**ARTH 1381** Art & Society: Renaissance to Modern  
**ARTH 2389** Modern & Contemporary Art  
**COMM 1332** Fundamentals of Public Speaking  
**ENRG 3310** Introduction to Energy & Sustainability  
**ENTR 3310** Entrepreneurship  
**GENB 3300** Introduction to Personal Finance  
**HDCS 1300** Human Ecosystems and Technological Change  
**HDCS 3300** Organizational Decisions  
**MUSI 3300** Listening to Music Masterworks





# C.T. BAUER

## COLLEGE OF BUSINESS

The Bauer College of Business is more than a degree-granting institution. Here, we transform the lives of our students, as they transform our college.

Our students have said that Bauer is “Where Awesome Happens” – from nationally ranked programs led by faculty who are scholarly leaders and former executives and entrepreneurs to experiential learning opportunities with globally recognized companies, there’s no shortage of awesome here.

A Bauer degree has incredible value on the market. Our alumni base in Houston is more than 50,000, with Bauer graduates working at all levels across sectors. We also offer our students and alumni a dedicated resource in finding jobs and internships with the Rockwell Career Center, which provides one-on-one personalized career counseling, resume critiques and interview prep, and employer panels and career fairs.

# ACCOUNTING BBA

Studies in Accountancy & Taxation prepare students for measuring and analyzing the income, costs, sources and uses of funds of an organization on the basis of certain generally accepted principles. Such measurements and analyses are helpful to those directly responsible for attaining production, marketing and financial objectives.

The goals of the undergraduate program in accounting are to provide graduates with the ability to:

1. Record, analyze, and interpret financial and other information.
2. Identify and diagnose accounting problems.
3. Communicate business information in a clear and concise manner.
4. Recognize ethical and regulatory dilemmas
5. Demonstrate an understanding of accounting and financial concepts.

Careers are available in corporate, non-profit and government organizations, as well as in the field of public accounting.

Degree Requirements: **120**  
semester hours



## FOUNDATION COURSES

**ACCT 3366** Financial Reporting Frameworks  
**ACCT 3367** Intermediate Accounting I  
**ACCT 3368** Intermediate Accounting II  
**ACCT 3371** Accounting Information Systems  
**ACCT 3377** Cost Accounting  
**ACCT 4331** Federal Income Tax - Individual  
**ACCT 4335** Financial Statement Auditing

## ELECTIVE COURSES

**9 credit hours** of general electives  
**3 credit hours** of advanced business electives – any 3000 / 4000 level business course\*  
**9 credit hours** of advanced electives – any 3000 / 4000 level course\*

\*Optional: Certificate in Oil & Gas Accounting (ACCT majors only). Students should reserve 10 hours of electives for an O&G certificate.

***In order to earn a BBA degree, students must complete credit hour requirements:***

- UH Core Courses & Business Administration and Management Field of Study Courses
- Advanced-Level Business Requirements
- Major Coursework & Additional Elective Requirements

Along with non-credit requirements:

- A business writing evaluation (BWE); administered through GENB 3302. Clearing the BWE is required to file a degree plan.



# OIL & GAS ACCOUNTING

## UNDERGRADUATE CERTIFICATE

The Oil & Gas (O&G) Accounting Certificate delivers the tools and cross-functional expertise to prepare students for positions in the Oil & Gas industry. A three-course certificate in the area of Oil & Gas/Energy accounting was developed through a joint effort with Oil & Gas/Energy companies, CPA firms, and other affected stakeholders in 2009. Only a few schools offer a course in O&G accounting and none offer anything like this certificate. Houston Oil & Gas and Energy companies and large CPA firms will be looking to recruit students who have obtained this certificate.

Throughout the fall semester, representatives from accounting and industry firms will host a one-semester-hour colloquium course for O&G students. The colloquium is intended to help students learn about the companies, network with representatives, and learn what it means to be an accountant in the O&G/Energy industries. Many of these companies will offer internships designed to prepare students for a career in O&G/Energy accounting and provide them with invaluable exposure to practical experiences in the accounting profession. The O&G courses are not approved to fulfill the Texas State Board of Public Accountancy's (TSBPA) educational requirement of 30 credit hours of advanced accounting. However, these courses are approved to fulfill the 150 hours of college credit.

### Certificate Requirements:

Complete three required courses and one colloquium listed specifically for the certificate. Courses cannot be substituted for the required list.

To enroll in the O&G Colloquium, a student must:

- Have completed or have concurrent enrollment in ACCT 4378.
- Have a minimum cumulative and accounting GPA OF 2.5.
- Have a minimum cumulative GPA of 2.5 in the Oil & Gas courses.

### FOUNDATION COURSES

**ACCT 4378** Oil & Gas Accounting I

**ACCT 4381** Oil & Gas Accounting II

**ACCT 4382** Oil & Gas Accounting III

**ACCT 4107** O&G Colloquium (Fall Semester Only)



[bauer.uh.edu/departments/accy](http://bauer.uh.edu/departments/accy)



## GLOBAL ENERGY MANAGEMENT (GEM) TRACK AND CERTIFICATE

A degree in Finance offers studies in the theory and application of activities related to the financing and investment decisions of individuals, corporations and non-profit entities. This includes the analysis of risk, investment cost and benefits, and securities management, as well as the study of financial institutions and their operations. Emphasis is given to understanding decision processes and financial markets and developing optimal decisions.

The GEM track is a complete undergraduate education in energy business culminating in a BBA in Finance; it is a specialization of the traditional BBA in Finance which gives graduates the leading edge when entering the job market. Students of the GEM track are finance majors who take a series of pre-selected energy business electives in their junior and senior years.

Degree Requirements: **120**  
semester hours

### FOUNDATION COURSES

**FINA 4320** Investment Management  
**FINA 4330** Corporate Finance

#### 12 credit hours from the following:

**FINA 4350** Derivatives I: Options  
**FINA 4351** Derivatives II: Forwards, Futures and Swaps  
**FINA 4357** Commercial Liability  
**FINA 4358** Commercial Property  
**FINA 4359** Energy Insurance and Risk Management  
**FINA 4360** International Financial Management  
**FINA 4370** Energy Trading  
**FINA 4371** Energy Value Chain  
**FINA 4372** Upstream Economics  
**FINA 4373** Petrochemical and Refining Economics  
**FINA 4397** Approved Selected Topics in Finance

### ELECTIVE COURSES

**6 credit hours approved, energy-related advanced electives, selected from the following:**

**ENRG 3310** Introduction to Energy and Sustainability  
**ENGR 4320** Case Studies in Energy and Sustainability  
**ENGR 4397** Selected Topics on Energy and Sustainability  
**ENGR 4398** Independent Study on Energy and Sustainability  
**SCM 4302** Energy Supply Chain  
**SCM 4312** Project Management for Energy Industries  
**TECH 4310** Future of Energy and the Environment  
**ECON 3385** Economics of Energy  
**HIST 3349** War, Globalization, and Terrorism  
**MANA 4397** Strategic Leadership in the Energy Sector  
In sequence:  
**ACCT 3366** Financial Reporting Frameworks  
**ACCT 3367** Intermediate Accounting I (prereq: ACCT 3366)



In order to earn a BBA degree, students must complete credit hour requirements:

#### UH Core Courses & College Requirements:

- Business Administration and Management Field of Study Courses
- **BUSI 3302** Connecting Bauer to Business
- **STAT 3331** Statistical Analysis for Business Applications

#### Advanced-Level Business Requirements:

- Major Coursework
- **6 hours** of additional, advanced elective requirements
- **9 hours** of additional general electives

#### Along with non-credit requirements:

- A business writing evaluation (BWE); administered through BUSI 3302. Clearing the BWE is required to file a degree plan.

## GLOBAL ENERGY MANAGEMENT (GEM) PROFESSIONAL PROGRAM

The Bauer faculty surveyed the energy sector and took a novel approach when doing so by asking the industry what skill sets would you like to see in a business graduate. The responses all centered on a theme; “we would like your business graduates to have grounding in technical disciplines. The energy industry is a very technical industry mostly comprised of engineers. Our business leaders need to be able to communicate and work in a technical environment.” The GEM Professional Program provides the basis for these fundamentals. This edge will allow you the potential to explore positions within the energy industry which might otherwise be unavailable to you.

The GEM Professional Program is the most powerful and comprehensive blend of technical and business skills available at the undergraduate and graduate level. Students in this program obtain a BBA in Finance with a GEM specialization. Meant to begin at the freshman year and carry through graduation, the GEM Professional Program requires a higher level math and science core than the traditional BBA in Finance. In addition to the required business core course work, GEM-PP students take all their advanced-elective courses in energy business.

Degree Requirements: **120**  
semester hours

### FOUNDATION COURSES

**FINA 4320** Investment Management  
**FINA 4330** Corporate Finance

12 credit hours from the following:

**FINA 4350** Derivatives I: Options  
**FINA 4351** Derivatives II: Forwards, Futures and Swaps  
**FINA 4357** Commercial Liability  
**FINA 4358** Commercial Property  
**FINA 4359** Energy Insurance and Risk Management  
**FINA 4360** International Financial Management  
**FINA 4370** Energy Trading  
**FINA 4371** Energy Value Chain  
**FINA 4372** Upstream Economics  
**FINA 4373** Petrochemical and Refining Economics  
**FINA 4397** Approved Selected Topics in Finance

### ELECTIVE COURSES

**6 credit hours approved, energy-related advanced electives, selected from the following:**

**ENRG 3310** Introduction to Energy and Sustainability  
**ENGR 4320** Case Studies in Energy and Sustainability  
**ENGR 4397** Selected Topics on Energy and Sustainability  
**ENGR 4398** Independent Study on Energy and Sustainability  
**SCM 4302** Energy Supply Chain  
**SCM 4312** Project Management for Energy Industries  
**TECH 4310** Future of Energy and the Environment  
**ECON 3385** Economics of Energy  
**HIST 3349** War, Globalization, and Terrorism  
**MANA 4397** Strategic Leadership in the Energy Sector  
In sequence:  
**ACCT 3366** Financial Reporting Frameworks  
**ACCT 3367** Intermediate Accounting I (prereq: ACCT 3366)

**In order to earn a BBA degree, students must complete credit hour requirements:**

UH Core Courses and Additional GEM-PP Requirements:

Life & Physical Sciences requires PHYS 1321 plus either:

- (1) CHEM 1331+1111 & CHEM 1331+1112, or
- (2) Any two from CHEM 1301, GEOL 1330, or GEOL 3378

GEM-PP Mathematics Requirement:

- **MATH 1313** Finite Mathematics
- **MATH 1431** Calculus I
- **MATH 1432** Calculus II
- **MATH 2433** Calculus III

Business Administration & Management Field of Study Courses:

- **BUSI 3302** Connecting Bauer to Business:
- **STAT 3331** Statistical Analysis for Business Applications

Additional Advanced-Level Business Requirements & Major Coursework

Along with non-credit requirements:

- A business writing evaluation (BWE); administered through BUSI 3302. Clearing the BWE is required to file a degree plan.

# SUPPLY CHAIN MANAGEMENT **BBA**

Supply Chain Management (SCM) encompasses the planning and management of all the activities and resources that organizations use to produce goods and services that satisfy customer demands.

Supply Chain Management (SCM) students at the Bauer College learn how to analyze the supply chain core processes and develop recommendations that enable companies to reduce costs, improve productivity, and achieve greater customer satisfaction. Recent graduates of supply chain management have taken jobs as analysts and/or consultants in areas such as service operations, quality management, project management, purchasing, inventory management, manufacturing planning, transportation logistics management, Enterprise Resource Planning (ERP), and many other areas. These jobs include: Supply Chain Management Professional, Production Planner, Transportation Planner, and Buyer/Planner.

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

**Prerequisite:** a grade of C or higher in STAT 3331 and a grade of C+ or higher in SCM 3301.

**SCM 4301** Logistics Management  
**SCM 4330** Business Modeling and Decision Analysis  
**SCM 4350** Strategic Supply Management  
**SCM 4362** Demand and Supply Integration  
**SCM 4367** Process and Quality Management  
**SCM 4390** Supply Chain Strategy

### ELECTIVE COURSES

**6 credit hours advanced business electives, to be selected from the following:**

**SCM 4302** Energy Supply Chain  
**SCM 4311** Project Management  
**SCM 4351** Strategic Sourcing and Spend Analysis  
**SCM 4380** Enterprise Resource Planning  
**SCM 4385** Supply Chain Analytics  
**FINA 4371** Energy Value Chain  
**MANA 4340** Cross-Cultural Comm & Negotiations

***In addition, in order to earn a BBA degree, students must complete credit hour requirements:***

UH Core Courses & College Requirements  
Business Administration and Management Field of Study  
Courses

- BUSI 3302 Connecting Bauer to Business
- STAT 3331 Statistical Analysis for Business Applications with a grade of C or higher
- SCM 3301 Supply Chain Management Fundamentals with a grade of C+ or higher

Additional Advanced-Level Business Courses  
Major Coursework

- **6 Hours** of Additional Advanced Elective Requirements
- **9 Hours** of Additional General Electives

Along with non-credit requirements:

- A business writing evaluation (BWE); administered through GENB 3302. Clearing the BWE is required to file a degree plan.



# ENERGY SUPPLY MANAGEMENT

## UNDERGRADUATE CERTIFICATE

The Bauer Supply Chain Management (BBA) program offers students an opportunity to focus their degree objectives in on one of three specific areas: Sourcing, Analytics, or Energy Supply Management. Students who demonstrate competence in these areas by taking specific electives beyond the core course requirements earn certificates that demonstrate to potential employers they have developed additional skills that many employers seek.

Degree Requirements: **6**  
semester hours



## ELECTIVE COURSES

***Students who successfully complete six credit hours of specific electives with an average grade of B or higher can earn the Energy Supply Management Certificate:***

ONE of the Following:

- **SCM 4302** Energy Supply Chain
- **FINA 4371** Energy Value Chain

In addition to:

- **SCM 4311** Project Management

SCM majors can pursue multiple certificates, utilizing the additional SCM elective courses to satisfy their advanced elective requirements without adding any additional hours to their degree plan.

[bauer.uh.edu/undergraduate/supply-chain-management/certificates.php](http://bauer.uh.edu/undergraduate/supply-chain-management/certificates.php)



# CULLEN

## COLLEGE OF ENGINEERING

The mission of the Cullen College of Engineering at the University of Houston is to serve the Greater Houston community, Texas and the nation by educating engineers to assume leadership positions in the identification and solution of the complex technical challenges of society, to advance the state of knowledge through pioneering research and scholarly work, to facilitate the transfer of new technology to Texas and U.S. industries, to play a key role in economic development for the Greater Houston region and the State of Texas, and to benefit the public sector through service to the university, community, industry, government and the engineering profession.

Achieving and maintaining academic excellence at the UH Cullen College of Engineering is serious business. The admission standards for entering the Cullen College are very high – but the hard work doesn't end once you're admitted. It takes a great deal of hard work, studying and perseverance to make it through to graduation.



# CHEMICAL ENGINEERING

## BSCHE

The Department of Chemical and Biomolecular Engineering (CHBE) at the University of Houston is dedicated to producing graduates of the highest scholarship and with skills that will enable them to prosper in their careers and to adapt to a field in transition.

The Department of Chemical and Biomolecular Engineering is committed to providing a high-quality education for undergraduate students in Chemical Engineering through a comprehensive curriculum that emphasizes basic science, mathematics, engineering science, and engineering design. UH CHEE faculty members are expected to maintain their reputations as superior teachers and to provide a stimulating educational environment. The Department's varied and aggressively pursued research ensures that our faculty members remain at the technological forefront of their respective areas of specialization.

We are in service to the community at large and, in particular, to the City of Houston and the State of Texas, and to provide the local engineering community opportunities for advanced and continuing education.

## Degree Requirements: **130** semester hours

### FOUNDATION COURSES

**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**CHEE 2331** Chemical Processes  
**CHEE 2332** Chemical Engineering Thermodynamics I  
**CHEE 3300** Materials Science and Engineering I  
**CHEE 3321** Analytical Methods for Chemical Engineers  
**CHEM 3332** Fundamentals of Organic Chemistry  
**CHEM 3221** Fundamentals of Organic Chemistry Laboratory  
**CHEM 3332** Fundamentals of Organic Chemistry  
**CHEE 3333** Chemical Engineering Thermodynamics II  
**CHEE 3334** Statistical/Numerical Techniques for Chemical Engineers  
**CHEE 3363** Fluid Mechanics for Chemical Engineers  
**CHEE 3367** Process Modeling and Control  
**CHEE 3369** Chemical Engineering Transport Processes  
**CHEE 3462** Unit Operations

**CHEE 3466** Biological and Physical Chemistry  
**CHEE 4321** Chemical Engineering Design I  
**CHEE 4361** Chemical Engineering Practices  
**CHEE 4322** Chemical Engineering Design II  
**CHEE 4367** Chemical Reaction Engineering  
**CHEE 4366** Biomolecular Engineering Fundamentals  
**ECON 2304** Microeconomic Principles  
**ENGI 1100** Introduction to Engineering  
**ENGI 1331** Computing and Problem Solving for Engineers  
**ENGI 2304** Technical Communications for Engineers  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**PHYS 1321** University Physics I  
**PHYS 1322** University Physics II

### ELECTIVE COURSES

**3 credit hours** chemistry elective  
**3 credit hours** advanced science elective  
**6 credit hours** technical electives

# CIVIL ENGINEERING BSCE

Civil engineering is a broad field that encompasses numerous sub-disciplines including structural engineering, environmental engineering, geotechnical engineering, water resources engineering, geosensing systems engineering, transportation engineering, and others. Because the jobs available in the field of civil engineering are so diverse, UH's Bachelor of Science in Civil Engineering degree is designed to offer students a broad base to prepare graduates for a variety of positions. In the junior and senior year students can personalize their degree by choosing civil engineering electives focused on a specific civil engineering sub-discipline or they can choose electives spread across multiple areas of civil engineering. Further specialization after the senior year is offered through graduate education where students can focus on specific aspects of civil engineering, environmental engineering, or geosensing systems engineering.

Degree Requirements: **130**  
semester hours

## FOUNDATION COURSES

**CIVE 2330** Mechanics I (Statics)  
**CIVE 2332** Mechanics of Solids  
**CIVE 3331** Environmental Engineering  
**CIVE 3332** Engineering Materials  
**CIVE 3337** Structural Analysis  
**CIVE 3339** Geotechnical Engineering  
**CIVE 3434** Fluid Mechanics and Hydraulic Engineering  
**CIVE 4363** Concrete Design  
**CIVE 4369** Foundation Engineering  
**CIVE 4311** Professional Practice in Civil Engineering  
**CIVE 4332** Hydrology  
**CIVE 4333** Water and Wastewater Treatment  
**CIVE 4312** Civil Engineering Design Project  
**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**ENGI 1100** Introduction to Engineering  
**ENGI 1331** Computing and Problem Solving for Engineers  
**ENGI 2304** Technical Communications for Engineers

**ENGI 2334** Introduction to Thermodynamics  
**INDE 2333** Engineering Statistics I  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**MECE 2334** Thermodynamics  
**MECE 3336** Mechanics II (Dynamics)  
**MECT 3341** Computer Aided Drafting  
**PHYS 1321** University Physics I  
**PHYS 1322** University Physics II

### ONE of the following:

**GEOL 1330** Physical Geology  
**BIOL 1361** Introduction to Biological Science I

## ELECTIVE COURSES

**12 credit hours** of civil engineering electives



# ELECTRICAL ENGINEERING

## BSEE

At the UH Cullen College of Engineering's Department of Electrical and Computer Engineering (ECE), undergraduates will get a broad sampling of courses from several areas involving electrical and electronic systems, but in your last two years you will choose from among six specialty areas: electronics; nanotechnology; power and alternative energy; computers and embedded systems; electromagnetics; and signals, systems and communication. Working in these areas involves the analysis and design of systems including antennas, robotics, power distribution, digital signal processing, semiconductor devices and integrated circuits, analog and digital control systems, communication networks and more!

In the last two years of the BSEE degree plan, students must choose one of six Concentration Areas. The Concentration Area allows the student to choose a subset of Electrical Engineering that is of particular interest to the student, while still encouraging the student to take courses in related areas. Concentration Areas: Signals, Communications and Controls; Electronics; Nanosystems; Applied Electromagnetics; Power and Renewable Energy; Computers and Embedded System.

Degree Requirements: **129**  
semester hours

### FOUNDATION COURSES

**ECE 2201** Circuit Analysis I  
**ECE 2202** Circuit Analysis II  
**ECE 2100** Circuit Analysis Lab  
**ECE 3331** Programming Applications in ECE  
**ECE 3436** Microprocessor Systems  
**ECE 3337** Signals and Systems Analysis  
**ECE 3355** Electronics  
**ECE 3155** Electronics Laboratory  
**ECE 3317** Applied Electromagnetic Waves  
**ECE 3340** Numerical Methods for ECE  
**ECE 3441** Digital Logic Design  
**ECE 4335** Electrical and Computer Engineering Design I  
**ECE 4336** Electrical and Computer Engineering Design II  
**ECON 2304** Microeconomic Principles  
**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**ENGI 1100** Introduction to Engineering

**ENGI 1331** Computing and Problem Solving for Engineers  
**ENGI 2304** Technical Communications for Engineers  
**INDE 2333** Engineering Statistics I  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**PHYS 1121** University Physics I Lab  
**PHYS 1121** Physics Lab I  
**PHYS 1322** University Physics II  
**PHYS 1122** Physics Lab II

### ELECTIVE COURSES

Students must select ONE of six Electrical Engineering Concentration Areas, completing a total of 7 lecture courses and 4 laboratory courses in their chosen Concentration Area.

Students must also complete 2 ECE electives at the 3000, 4000, or 5000 level (and satisfy any prerequisites necessary).

In addition, students must complete 1 Technical Elective from an approved course list – alternatively, students may take a third ECE elective to satisfy this requirement.

# INDUSTRIAL ENGINEERING **BSCE**

Industrial engineers are optimization experts, focusing on the effective use of people, machines, materials, information and energy to improve processes for products and services. This unique engineering field includes the development of analytical methods and techniques that concentrate on higher productivity and better quality. Firms looking to develop more efficient processes hire industrial engineers to reduce costs and waste while increasing safety and efficiency.

Industrial engineers are trained to work virtually anywhere in industry to improve system performance. Specific industries include manufacturing, logistics and transportation, supply chain, energy, oil and gas, healthcare, retail, hotel chains, airlines, construction companies, banks, social services and government.

Degree Requirements: **125**  
semester hours

## FOUNDATION COURSES

**INDE 2333** Engineering Statistics I  
**INDE 2331** Computer Applications for Industrial Engineers  
**INDE 3330** Financial and Cost Management  
**INDE 3333** Engineering Economy I  
**INDE 3382** Stochastic Models  
**INDE 3364** Engineering Statistics II  
**INDE 3310** Statistical Process Quality Control and Improvement  
**INDE 3432** Manufacturing Processes  
**INDE 3381** Linear Optimization  
**INDE 4331** Analysis of Industrial Activities  
**INDE 4369** Facilities Planning and Design  
**INDE 3362** CAD/CAM  
**INDE 4370** Discrete Event Simulation  
**INDE 4111** Industrial Engineering Seminar  
**INDE 4320** Computer Integrated Manufacturing  
**INDE 4364** Big Data and Analytics  
**INDE 4315** Supply Chain Design and Management  
**INDE 4372** Operations Control  
**INDE 4337** Human Factors and Ergonomics  
**INDE 4334** Engineering Systems Design

**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**ENGI 1100** Introduction to Engineering  
**ENGI 1331** Computing and Problem Solving for Engineers  
**ENGI 2304** Technical Communications for Engineers  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**MECE 3400** Introductions to Mechanics  
**PHYS 1321** University Physics I  
**PHYS 1322** University Physics II

## ELECTIVE COURSES

**3 credit hours** technical elective





# MECHANICAL ENGINEERING

## BSME

The Bachelor of Science in mechanical engineering at the University of Houston prepares students for careers in one of the most versatile engineering professions. Mechanical engineers are the jack-of-all-trades within the engineering profession. Just about everything you can think of involves a mechanical process, and anything with a mechanical process is the business of a mechanical engineer. These engineers work in nearly every industry you can imagine, addressing problems in such areas as energy conversion, aerospace, design of mechanical components and systems, man and machine environments, product reliability and safety, polymers, materials, and instrumentation and control of processes.

Undergraduate students in the mechanical engineering department are taught to connect the dots between classroom lessons and their real-world applications through project-based learning, hands-on laboratory research, Capstone design projects and seminars led by industry professionals. The department's curriculum provides students with the opportunity to learn how to think creatively and logically, and how to use new-found knowledge to address complex problems. Throughout the curriculum, but particularly in the three-course design sequence, students are challenged with creative design problems. To solve these problems, students use skills learned from classes in mechanics of materials, experimental methods, engineering analysis, controls, materials science, thermodynamics, fluid mechanics and heat transfer.

Degree Requirements: **128**  
semester hours

### FOUNDATION COURSES

**MECE 3336** Mechanics II (Dynamics)  
**MECE 2334** Thermodynamics  
**MECE 2361** Introduction to Mechanical Design  
**MECE 3338** Dynamics and Control of Mechanical Systems  
**MECE 3345** Materials Science  
**MECE 3245** Materials Science Lab  
**MECE 3369** Solid Mechanics  
**MECE 3360** Experimental Methods  
**MECE 3363** Introduction to Fluid Mechanics  
**MECE 3381** Introduction to Finite Element Methods for Mechanical Engineers  
**MECE 4364** Heat Transfer  
**MECE 4331** Design of Machine Elements  
**MECE 4343** Thermal Design  
**MECE 4340** Mechanical Engineering Capstone I  
**MECE 4341** Mechanical Engineering Capstone II  
**CHEM 1331** Fundamentals of Chemistry I

**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**CIVE 2330** Mechanics I  
**ENGI 1331** Computing and Problem Solving for Engineers  
**ENGI 2304** Technical Communications for Engineers  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**MATH 3363** Introduction Partial Differential Equations  
**PHYS 1321** University Physics I  
**PHYS 1322** University Physics II  
**MECE 4371** Thermal-Fluids Lab



### ELECTIVE COURSES

Students with senior standing in Mechanical Engineering are required to take four technical electives. The elective requirements can be satisfied with one of the following options:

- Take 4 MECE 5000-level or higher courses
- Take 3 MECE 5000-level or high courses, and one course from the approved list of non-MECE 3000 / 4000 / 5000 level courses from other departments in engineering, math, or science.
- Complete a senior honors thesis using MECE 3399 (Senior Honors Thesis I) and MECE 4399 (Senior Honors Thesis II), and then complete two MECE 5000-level or higher courses.

The drafting requirement (with no credit toward graduation) may be satisfied by completing MECT 1330 (Engineering Graphics) or MECT 3341 (Computer-Aided Drafting I). A computer-aided course is recommended.

[chee.uh.edu](http://chee.uh.edu)



M.D. ANDERSON LIBRARY

The Honors College provides the advantages of a small community amid the rich and diverse settings of a large, urban university. Our students are part of an elite group of university intellectuals whose enthusiasm for materials covered within our coursework can be felt throughout The Honors College's hallways and Commons. In addition to exclusive amenities and special privileges, our students benefit from a dynamic learning environment and one-on-one mentoring from world-renowned faculty.

Through a challenging and well-balanced curriculum, our students learn both the skills they will need for professional success, and how and when to apply them.

The Honors College at the University of Houston is a nationally recognized, intellectually stimulating learning community. As a vibrant, leading presence within the University, the Honors College attracts highly talented and motivated students and educators to a collegial environment where tradition is honored and possibilities are both created and realized.

# THE HONORS COLLEGE





# THE HONORS COLLEGE

## ***HONORS ENGINEERING***

The Cullen College of Engineering and the Honors College jointly offer a program for Honors College students with majors in engineering: the Honors Engineering Program (HEP).

The HEP is a challenging program that encourages a sense of community among Honors students in Engineering and provides an improved experience by offering courses tailored to the needs of these capable, enthusiastic students. As an example, the freshman-level HEP courses, beginning with ENGI 1100 Honors, emphasize team-based, project-oriented learning in small classes, restricted to HEP students. These fun, hands-on courses focus on fostering creative, open-ended thinking and engineering design. HEP students will fulfill many required courses in Honors sections of required engineering courses.

Many HEP students find they are earning internships and other opportunities by virtue of their participation in HEP. In addition, HEP students have access to the Honors Engineering Program list-serve to find out about upcoming HEP events, such as meetings with industry representatives, field trips to engineering companies and sporting events, and various social events.

To join the Honors Engineering Program, students must be accepted to the Honors College and to the Cullen College of Engineering.


## ***ENERGY & SUSTAINABILITY MINOR***

The Energy & Sustainability minor welcomes students from all majors. Although housed in the Honors College, it is open to all qualified students. The program takes an aggressively interdisciplinary approach to the study of sustainable energy systems. It pays special attention to the crowded intersection of energy security and environmental stewardship. Here we find technical, economic, environmental, and political issues raised by the production and consumption of different fuels. These range from the traditional environmental impacts of energy use on air, water, and land to the global challenges of climate change.

The most significant issues of the 21st century loom large in this course, and students are encouraged to learn to think creatively and independently about them. Breadth of understanding is a central goal of interdisciplinary study, and our minor offers a blend of courses in an array of disciplines, including business, engineering, the natural sciences, architecture, economics, political science, and history.

The required introductory and capstone courses combine with the wide choice of electives and research projects in many of the classes to give students ample flexibility to learn in depth about topics of special interest or to acquire a breadth of knowledge about energy and sustainability. Understanding these two closely-related topics will be essential to responsible citizenship in the coming decades.

[uh.edu/honors](http://uh.edu/honors)



The College of Liberal Arts and Social Sciences (CLASS) is the heart of the University, dedicated to spurring intellectual curiosity, creativity, and transformative education. Encompassing humanities, social sciences, and health sciences, CLASS is truly a mosaic of disciplines that broaden perspectives, inspire potential, and advance possibilities yet unimagined.

The College's goal is to stimulate and expand students' cultural, mental and physical explorations through rich course offerings, study abroad programs and campus events. We encourage students to delve into the questions of life while building critical and analytical skills that animate professions and launch successful careers.

Our 584 faculty members educate nearly 10,000 undergraduate majors and minors and 1,200 graduate students, preparing them for future studies and professional achievements.

# COLLEGE OF LIBERAL ARTS AND SOCIAL SCIENCES



# ECONOMICS BS

Economics is the study of how a society chooses to allocate its finite resources among the infinite demands of its members. This includes analysis of the decisions made by households and firms about production and consumption of finished goods, inputs to production, and labor services, in addition to analysis of the impact of public policies on these decisions and on the economic well-being of society and its members.

Specific subject areas studied in economics include aggregate analysis of business cycles and economic growth (macroeconomics), analysis of labor markets, public finance and taxation, industrial organization, international trade, the economics of money and banking, and studies in specialized fields.

The academic programs of the Department of Economics seek to develop students' capacity to think systematically and analytically about social issues. These analytical abilities give our graduates a strong fundamental background for success in professional life. The department's graduate programs prepare students for careers as economists in business, government, and the academic community. The undergraduate program has been designed to allow students maximum flexibility to orient their curriculum either toward preparation for graduate study in law, business, or economics, or toward professional courses and career placement.

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

- ECON 2304** Microeconomic Principles
- ECON 2305** Macroeconomic Principles
- ECON 2370** Introduction to Economic Data Analysis
- ECON 3332** Intermed Microeconomics
- ECON 3334** Intermed Macroeconomics
- ECON 3370** Introduction to Econometrics

ONE of the following:

- MATH 1314** Calculus for Business and the Life Sciences
- MATH 1431** Calculus I

### ELECTIVE COURSES

**15 hours of advanced ECON electives** – any 3000 / 4000 level course

In addition to the academic experience, the department offers undergraduate students an opportunity for practical experience through our internship program. The internship program allows students to earn advanced economics credit while obtaining practical experience in a professional environment.

**ECON 4390** Economics Internship  
This class is designed for students interested in working in selected private industry, federal, state and local government offices.



[uh.edu/class/economics](http://uh.edu/class/economics)

# COLLEGE OF NATURAL SCIENCES AND MATHEMATICS

The College of Natural Sciences and Mathematics (NSM) is committed to excellence in teaching, research, and service in the physical and biological sciences, computer science, and mathematics. NSM's location in the nation's fourth-largest city and energy capital of the world presents numerous opportunities for collaboration with the oil and gas industry, Texas Medical Center, NASA's Johnson Space Center, and other entities.

NSM hosts more than 5,000 students and confers more than 900 degrees awarded each year, with more than 200 ranked faculty, including four National Academy of Sciences members. NSM also enjoys a solid research funding base with \$30 million in annual research expenditures, academic collaborations with numerous institutions, industry consortia and partnerships, and outreach programs with local school districts. The College's innovative resources, including a centralized testing and tutoring center and peer-led team learning workshops ensure student success.



The Department of Chemistry's teaching and research encompasses organic, inorganic, and physical chemistry. Energy and biomedical applications and materials chemistry are research focus areas. Our faculty strongly supports undergraduate research. The best way to learn about the excitement of chemistry is to perform research in a laboratory with experienced graduate students and postdoctoral researchers. Chemistry faculty members welcome undergraduates into their research groups as early as the sophomore year. Recognized as some of the best teachers on campus, the department's faculty members have won numerous university level and NSM teaching awards. Several have won multiple teaching awards.

## Degree Requirements: **120** semester hours

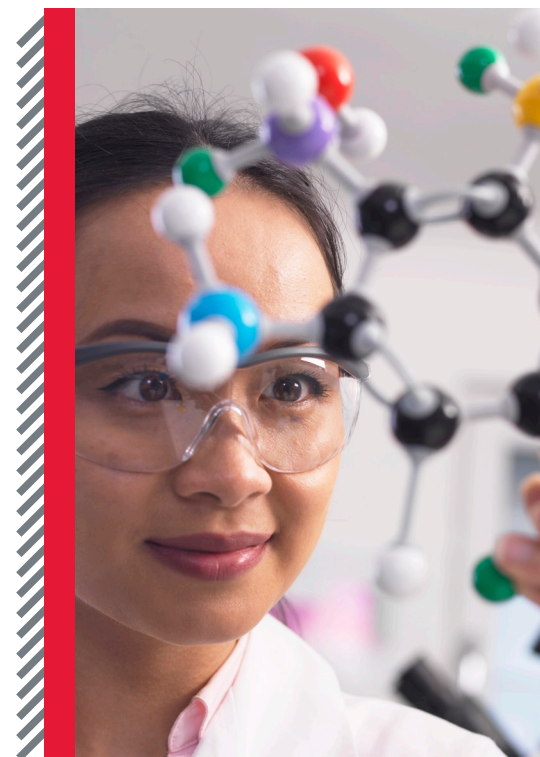
### FOUNDATION COURSES

**PHYS 1321** University Physics I  
**PHYS 1121** University Physics I Lab  
**PHYS 1322** University Physics II  
**PHYS 1122** University Physics II Lab  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry Lab I  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry Lab II  
**CHEM 2233** Inorganic Chemistry I  
**CHEM 2133** Inorganic Chemistry I Lab  
**CHEM 3331** Fundamentals of Organic Chemistry I  
**CHEM 3221** Fundamentals of Organic Chemistry I Lab  
**CHEM 3332** Fundamentals of Organic Chemistry II

**CHEM 3222** Fundamentals of Organic Chemistry II Lab  
**CHEM 3369** Analytical Chemistry  
**CHEM 3119** Analytical Chemistry Lab  
**CHEM 4365** Inorganic Chemistry II  
**CHEM 4115** Inorganic Chemistry II Lab  
**CHEM 4369** Analytical Chemistry II  
**CHEM 4229** Instrumental Methods of Analysis Lab  
**CHEM 4370** Physical Chemistry I  
**CHEM 4270** Physical Chemistry I Lab  
**CHEM 4372** Physical Chemistry II  
**CHEM 4272** Physical Chemistry II Lab  
**CHEM 4336** Fundamental Biochemistry

### ELECTIVE COURSES

**3 credit hours** of approved advanced CHEM elective – 3000 / 4000 level course



# COMPUTER SCIENCE BS

Computer science is the systematic study of computing systems and computation. Numerous professional opportunities exist for graduates with computer science degrees, including hardware development, software engineering, Internet systems and technology, game design, computer graphics, animation, robotics, artificial intelligence, security, data analytics, medicine, biotechnology, business management and consulting, computational modeling, as well as graduate study in computing-related fields.

The Bachelor of Science in Computer Science at the University of Houston is rigorous. All students majoring in computer science must take a substantial number of courses in mathematics. Students considering majoring in computer science should have shown considerable ability in mathematics and logical reasoning. Students majoring in computer science also receive extensive instruction in state-of-the art computing architectures, operating systems, compilers, and software engineering methods and practices. Therefore, they combine a good mathematical background with the ability to design and develop quality software on a large scale.

Degree Requirements: **120**  
semester hours

## FOUNDATION COURSES

**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 3339** Statistics for the Sciences  
**COSC 1306** Computer Science and Programming  
**COSC 1430** Introduction to Programming  
**COSC 2430** Programming and Data Structures  
**COSC 2440** Computer Organization and Architecture  
**COSC 3320** Algorithms and Data Structures  
**COSC 3340** Introduction to Automata and Computability  
**COSC 3360** Fundamentals of Operating Systems  
**COSC 3380** Design of File and Database Systems  
**MATH 336** Discrete Mathematics

### ONE of the following:

**MATH 2331** Linear Algebra  
**MATH 3321** Engineering Mathematics

## ELECTIVE COURSES

### 3 credit hours software engineering elective, selected from the following:

**COSC 4351** Fundamentals of Software Engineering  
**COSC 4353** Software Design

Computer Science students must complete 14 credit hours of NSM approved Natural Sciences; 8 of those hours (2 labs and 2 lectures) must be in the same discipline.

**12 credit hours** of advanced COSC electives – 3000 / 4000 level courses





# ENVIRONMENTAL SCIENCES BS

## Atmospheric Sciences Track or Environmental Geosciences Track

The study of interactions among physical, chemical, and biological components of the environment. The degree plan has options in environmental geosciences and atmospheric sciences. Areas of study include climate change, conservation, water quality, groundwater and soil contamination, use of natural resources, waste management, sustainable development, and air pollution.

### Degree Requirements: **120** semester hours

#### FOUNDATION COURSES

**GEOL 1330** Physical Geology  
**GEOL 1130** Physical Geology Lab  
**BIOL 1361** Introduction to Biological Science I  
**BIOL 1161** Introduction to Biological Science I Lab  
**BIOL 1362** Introduction to Biological Science II  
**BIOL 1162** Introduction to Biological Science II Lab  
**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3339** Statistics for the Sciences  
**PHYS 1321** University Physics I  
**PHYS 1121** University Physics I Lab  
**PHYS 1322** University Physics II  
**PHYS 1122** University Physics II Lab

#### ONE of the following course sequences:

**GEOL 1302** Introduction to Global Climate Change  
**GEOL 1102** Introduction to Global Climate Change Lab

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**GEOL 1350** Introduction to Meteorology  
**GEOL 1150** Introduction to Meteorology Lab

**Capstone Requirement:** All students in the College of Natural Sciences and Mathematics must complete the Capstone requirement. Students may satisfy the Capstone by:

- Completing an approved minor
- A double major
- A senior research project
- A senior honors thesis
- 6 credit hours of NSM-designated interdisciplinary capstone courses

#### ENVIRONMENTAL GEOSCIENCE TRACK

##### 6 credit hours required courses:

**GEOL 3340** Geologic Field Methods  
**GEOL 3370** Mineralogy

##### 15 credit hours from the following Group 1 electives:

**GEOL 3331** Environmental Geology  
**GEOL 3338** Environmental Hydrology  
**GEOL 4331** Geospatial Analysis and Applications  
**GEOL 4334** Environmental Data Analysis  
**GEOL 4356** Environmental Science Field Research  
**GEOL 4365** Environmental Geochemistry  
**GEOL 4367** Geochemical Reaction Modeling

**Additional 18 credit hours of approved electives from the Group 2 course list, see advisor for list.**

#### ATMOSPHERIC SCIENCE TRACK

##### 6 credit hours required courses:

**GEOL 3342** Principles of Air Pollution  
**GEOL 3378** Principles of Atmospheric Science

##### 15 credit hours from the following Group 1 electives:

**GEOL 3382** Atmospheric Chemistry  
**GEOL 4334** Environmental Data Analysis  
**GEOL 4346** Air Pollution Meteorology  
**GEOL 4343** Atmospheric Instrumentation  
**GEOL 4356** Environmental Science Field Research  
**GEOL 4336** Atmospheric Radiation  
**GEOL 4340** Aerosols and Climate

**Additional 18 credit hours of approved electives from the Group 2 course list, see advisor for list.**

[uh.edu/nsm/earth-atmospheric](http://uh.edu/nsm/earth-atmospheric)

# **GEOPHYSICS** BS

Housed in the Department of Earth and Atmospheric Sciences, Geophysics students study the Earth using gravity, magnetic, electrical, and seismic methods. Geophysicists study Earth's interior structure, the Earth's interior temperature distribution, the origin of the magnetic field, and large-scale crustal features, such as mountain belts and ocean basins. A few popular branches of study include seismology, hydrology and physical oceanography. Major applications of geophysics are in oil, gas and mineral explorations. Geophysical applications are also found in many environmental and engineering studies.

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

**GEOL 1330** Physical Geology  
**GEOL 1130** Physical Geology Lab  
**GEOL 3340** Geologic Field Methods  
**GEOL 3345** Structural Geology  
**GEOL 3145** Structural Geology Lab  
**GEOL 3350** Stratigraphy  
**GEOL 3150** Principles of Stratigraphy Laboratory  
**GEOL 3325** Rocks and Minerals  
**GEOL 4330** Introduction to Geophysics  
**GEOL 4355** Geophysical Field Camp  
**GEOL 4381** Geophysical Signals and Analysis  
**GEOL 4370** Global Seismology  
**CHEM 1331** Fundamentals of Chemistry  
**CHEM 1111** Fundamentals of Chemistry Lab I  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry Lab II

**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 3321** Engineering Mathematics  
**MATH 3363** Introduction to Partial Differential Equations  
**MATH 3364** Introduction to Complex Analysis  
**PHYS 1321** University Physics I  
**PHYS 1121** Physics Laboratory I  
**PHYS 1322** University Physics II  
**PHYS 1122** Physics Laboratory II

#### ONE of the following:

**GEOL 3370** Mineralogy  
**GEOL 3372** Petrography

### ELECTIVE COURSES

#### **12 credit hours of advanced geophysics electives, selected from the following:**

**GEOL 3383** Remote Sensing  
**GEOL 4332** Applications of GPS and LIDAR  
**GEOL 4379** Groundwater and Engineering Geophysics  
**GEOL 4385** Introduction to Marine Geophysics

#### **3 credit hours of advanced geoscience electives, selected from the following:**

**GEOL 3331** Environmental Geology  
**GEOL 3338** Environmental Hydrogeology  
**GEOL 3377** Oceanography  
**GEOL 3383** Remote Sensing  
**GEOL 4331** Geospatial Analysis and Applications  
**GEOL 4365** Environmental Geochemistry  
**GEOL 4382** Introduction to Petroleum Geology  
**GEOL 4397** Selected Topics-Geology

#### **Capstone Requirement:**

All students in the College of Natural Sciences and Mathematics must complete the Capstone requirement. Geophysics majors may satisfy the capstone by completing:  
**GEOL 4355** Geophysical Field Camp  
**GEOL 4381** Geophysical Signals and Analysis



Geology students study the evolution and development of Earth and processes that shape its internal and external structure; it includes the study of the solid earth as well as its fluid envelopes. Geoscientists are charged with a wide variety of tasks, such as finding adequate supplies of natural resources, protecting our natural environment from environmental degradation, reducing the risks associated with geologic hazards, documenting and understanding the evolution of life through time, and providing insights into past and future changes in global climate. The department runs a summer field camp in Geology at the Yellowstone-Bighorn Research Association field station near Red Lodge, Montana. UH faculty and students work on field projects in various remote parts of the world such as Antarctica, Asia, South America, as well as in Texas and the Gulf of Mexico.

## Degree Requirements: **120** semester hours



### FOUNDATION COURSES

**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**PHYS 1321** University Physics I  
**PHYS 1121** University Physics I Lab  
**PHYS 1322** University Physics II  
**PHYS 1122** University Physics II Lab  
**GEOL 1330** Physical Geology  
**GEOL 1130** Physical Geology Lab  
**GEOL 3330** Paleobiology

**GEOL 3130** Paleobiology Lab  
**GEOL 3340** Geologic Field Methods  
**GEOL 3345** Structural Geology  
**GEOL 3145** Structural Geology Lab  
**GEOL 3350** Stratigraphy  
**GEOL 3150** Principles of Stratigraphy Lab  
**GEOL 3355** Field Geology I  
**GEOL 3360** Field Geology II  
**GEOL 3370** Mineralogy  
**GEOL 3372** Petrography  
**GEOL 3373** Igneous and Metamorphic Petrogenesis  
**GEOL 3374** Sedimentary Petrogenesis  
**GEOL 4330** Introduction to Geophysics

### ELECTIVE COURSES

Additional **18 credit hours** of approved electives (including NSM Capstone Requirement).

- Historical Geology, Computer Science, Biology, and Foreign Language are highly recommended.

**6 credit hours of advanced geoscience electives, selected from the following list:**

**GEOL 3331** Environmental Geology  
**GEOL 3338** Environmental Hydrogeology  
**GEOL 3377** Oceanography  
**GEOL 3383** Remote Sensing  
**GEOL 4331** Geospatial Analysis and Applications  
**GEOL 4365** Environmental Geochemistry  
**GEOL 4382** Introduction to Petroleum Geology  
**GEOL 4397** Selected Topics in Geology

### Capstone Requirement:

All students in the College of Natural Sciences and Mathematics must complete the Capstone requirement. Students may satisfy the Capstone by:

- Completing an approved minor
- A double major
- A senior research project
- A senior honors thesis
- 6 credit hours of NSM-designated interdisciplinary capstone courses

Physics is the most basic and fundamental science. Physicists attempt to understand the natural laws around us, inside us, and in the universe beyond us. Physicists use experimental, analytical, and numerical skills to solve problems. Physicists make significant contributions in many fields. In the last century, physicists have received several Nobel prizes in chemistry, biology and economics.

Those who have a natural curiosity for investigating how things work and are good at math would enjoy physics as a major. Students considering majoring in physics should have strong science and math backgrounds.

Degree Requirements: **120**  
semester hours



## FOUNDATION COURSES

**PHYS 1321** University Physics I  
**PHYS 1121** University Physics I Lab  
**PHYS 1322** University Physics II  
**PHYS 1122** University Physics II Lab  
**PHYS 3309** Intermediate Mechanics  
**PHYS 3110** Seminar in Advanced Laboratory Analysis  
**PHYS 3313** Advanced Laboratory I  
**PHYS 3214** Advanced Laboratory II  
**PHYS 3315** Modern Physics I  
**PHYS 3316** Quantum Mechanics  
**PHYS 3327** Thermal Physics  
**PHYS 4321** Intermediate Electromagnetic Theory I  
**PHYS 4322** Intermediate Electromagnetic Theory II  
**CHEM 1331** Fundamentals of Chemistry I

**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MATH 2433** Calculus III  
**MATH 2331** Linear Algebra  
**MATH 3331** Differential Equations  
**MATH 3363** Introduction to Partial Differential Equations  
**MATH 3364** Introduction to Complex Analysis

### ONE of the following:

**PHYS 3312** Modern Optics and  
**PHYS 3112** Modern Optics Lab  
or  
**PHYS 4421** Electronic Devices and their Applications

## ELECTIVE COURSES

7 credit hours free elective  
6 credit hours approved advanced PHYS electives – 3000 level / 4000 level

### Capstone Requirement:

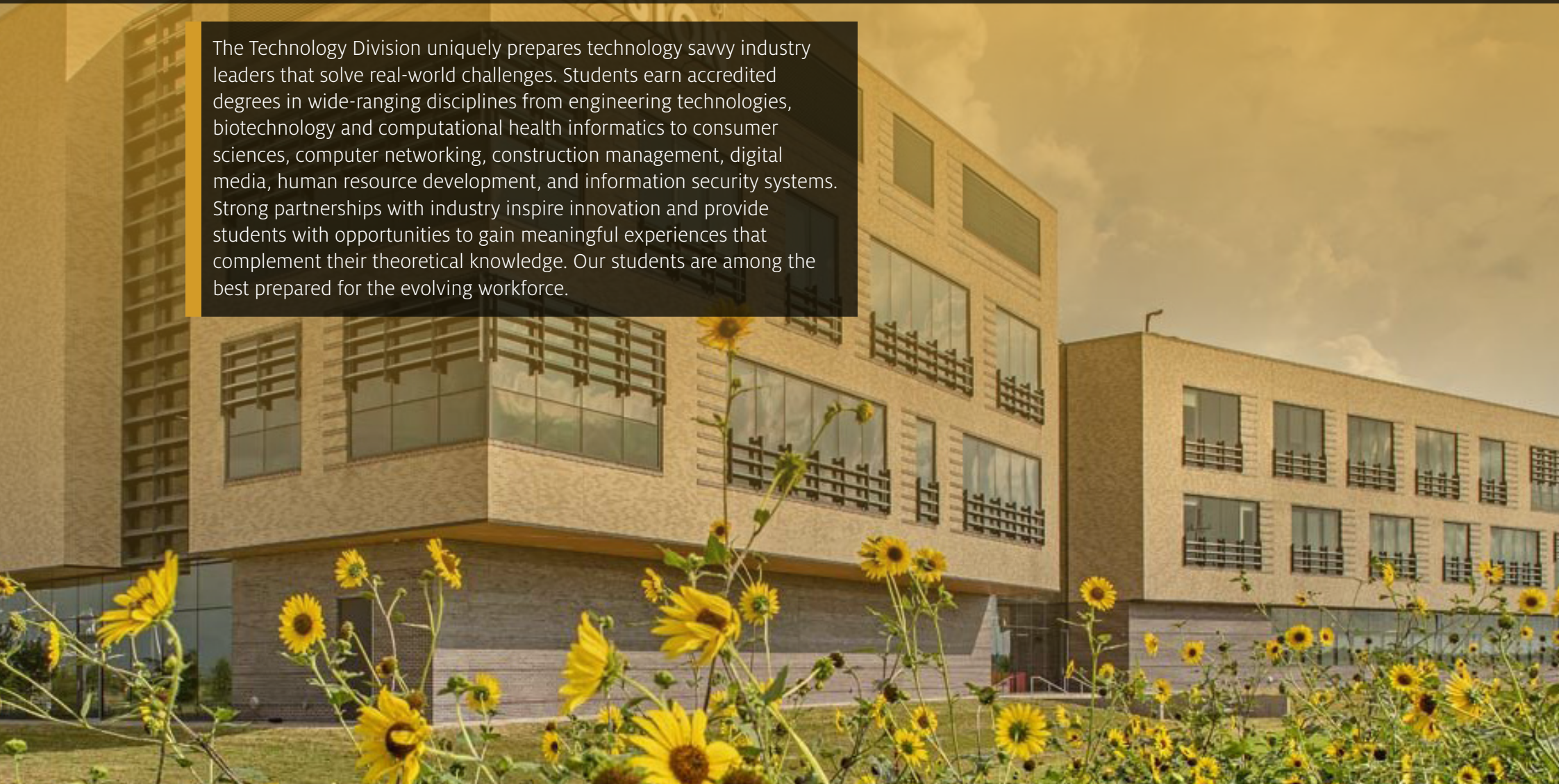
All students in the College of Natural Sciences and Mathematics must complete the Capstone requirement. Physics majors may satisfy the capstone by completing:

- An approved minor
- A double major
- A senior research project
- A senior honors thesis
- 6 credit hours of NSM-designated interdisciplinary capstone courses



# CULLEN COLLEGE OF ENGINEERING TECHNOLOGY DIVISION

The Technology Division uniquely prepares technology savvy industry leaders that solve real-world challenges. Students earn accredited degrees in wide-ranging disciplines from engineering technologies, biotechnology and computational health informatics to consumer sciences, computer networking, construction management, digital media, human resource development, and information security systems. Strong partnerships with industry inspire innovation and provide students with opportunities to gain meaningful experiences that complement their theoretical knowledge. Our students are among the best prepared for the evolving workforce.



# BIOTECHNOLOGY BS

The Biotechnology program prepares students with a strong foundation in skills that transform our future world. With practical, hands-on training, innovative research and teaching, the program attracts students who are eager to discover ways to contribute to the health of society and the environment. The Bioprocessing and Bioinformatics tracks offer the flexibility to adapt the degree based on interests, educational background and career goals.

The Bachelor of Science Program in Biotechnology is intended to provide students with strong core science concepts and an application-oriented undergraduate education. Strongly interdisciplinary, this innovative program draws faculty and courses from the College of Technology and the College of Natural Science and Math. The program's objective is to prepare students for employment opportunities in the critically important and dynamic biotechnology industry. In addition, the curriculum will provide students with knowledge and core set of skills that span across basic sciences, technology, engineering, and mathematics (STEM) education. With an emphasis on environmental biotechnology, this is the first program in the state of Texas that integrates bioprocessing, nanobiotechnology, bioinformatics and environmental biotechnology into the undergraduate curriculum.

Degree Requirements: **120** or **121**  
semester hours semester hours

## FOUNDATION COURSES

**BCHS 3304** General Biochemistry I  
**BCHS 3201** Biochemistry I Lab  
**BIOL 1361** Introduction to Biological Science I  
**BIOL 1161** Introduction to Biological Science I Lab  
**BIOL 1362** Introduction to Biological Science II  
**BIOL 1162** Introduction to Biological Science II Lab  
**BIOL 3332** Elementary Microbiology  
**BIOL 3132** Elementary Microbiology Lab  
**BTEC 1322** Introduction to Biotechnology  
**BTEC 3100** Biotechnology Research Methods and Applications  
**BTEC 3301** Principles of Genomics/Proteomics and Bioinformatics  
**BTEC 3302** Molecular Genetics and Biotechnology  
**BTEC 3317** Biotechnology Regulatory Environment  
**BTEC 3321** Current Good Manufacturing Practices in Biotechnology  
**BTEC 4350** Biotechnology Capstone Experience  
**CHEM 1331** Fundamentals of Chemistry I  
**CHEM 1111** Fundamentals of Chemistry I Lab  
**CHEM 1332** Fundamentals of Chemistry II  
**CHEM 1112** Fundamentals of Chemistry II Lab

**CHEM 3331** Fundamentals of Organic Chemistry  
**CHEM 3221** Fundamentals of Organic Chemistry Lab  
**CIS 2334** Information Systems Applications  
**ELET 2300** Introduction to C++ Programming  
**MATH 1330** Precalculus  
**MATH 1431** Calculus I  
**PHYS 1301** Introductory General Physics I  
**PHYS 1101** General Physics I Lab  
**HDCS 3300** Organizational Decisions in Technology  
**OR**  
**TLIM 3340** Organizational Leadership and Supervision  
**TLIM 3363** Technical Communications

### *One of the following:*

**MATH 2311** Introduction to Probability and Statistics  
**TMTM 3360** Applied Technical Statistics  
**PSYC 3301** Introduction to Psychological Statistics  
**MATH 3339** Statistics for Sciences

## BIOMANUFACTURING TRACK

**BTEC 3320** Introduction to Quality Assurance and Quality Control in Biotechnology  
**BTEC 4301** Principles of Bioprocessing  
**BTEC 4101** Principles of Bioprocessing Lab  
**BTEC 4319** Microbial Biotechnology  
**3 credit hours** approved electives

## BIOINFORMATICS TRACK

**BTEC 4300** Principles of Bioinformatics  
**CIS 3343** Info Systems Analysis & Design  
**CIS 3365** Database Management  
**3 credit hours** approved electives

## ELECTIVE COURSES

**6 credit hours** free elective  
**3 credit hours** approved electives



# COMPUTER ENGINEERING TECHNOLOGY **BS**

The Computer Engineering Technology, Bachelor of Science degree is a research-oriented, project-based, practical program where students learn about analog and digital electronics, microprocessor architecture and programming, hardware and software design, networked embedded systems, operating systems, communication, and computer networks. The CET program incorporates applications such as cyber-physical systems, smart and clean energy, healthcare and bio-medical systems, smart sensors, and embedded controls.

The goal of the Computer Engineering Technology program is to provide students with a high quality applications-oriented undergraduate education based on state-of-the-art technology as a preparation for productive employment in the broad field of microcomputer applications. With computers assisting nearly every professional and leisure activity of modern life, people who can design, install, configure, network, and repair microcomputer systems can make a valuable contribution to business and industry. People familiar with both the hardware and software requirements of computers are especially valuable.

The Computer Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET.

## Degree Requirements: **124** semester hours

### FOUNDATION COURSES

<b>ELET 1400</b> Circuit Theory and Lab I	<b>MATH 1432</b> Calculus II
<b>ELET 1401</b> Circuit Theory and Lab II	<b>MATH 3321</b> Engineering Mathematics
<b>ELET 2303</b> Digital Systems	<b>OR</b>
<b>ELET 2103</b> Digital Systems Lab	<b>MATH 3307</b> Statistical Applications
<b>ELET 2305</b> Semiconductor Devices and Circuits	<b>MECT 3341</b> Computer-Aided Drafting I
<b>ELET 2105</b> Semiconductor Devices and Circuits Lab	<b>MECT 4188</b> Ethics in Engineering Technology
<b>ELET 3301</b> Linear Systems Analysis	<b>TECH 3366</b> Applied Numerical Methods
<b>ELET 3402</b> Communications Circuits	<b>TLIM 3363</b> Technical Communications
<b>ELET 3403</b> Sensor Applications	<b>PHYS 1301</b> Introductory General Physics I
<b>ELET 3405</b> Microprocessor Architecture	<b>PHYS 1101</b> General Physics I Lab
<b>ELET 3425</b> Embedded Systems	<b>PHYS 1302</b> Introductory General Physics II
<b>ELET 4308</b> Senior Project	<b>PHYS 1102</b> General Physics II Lab
<b>ELET 4208</b> Senior Project Lab	
<b>ELET 4421</b> Computer Networks	<b>ONE of each of the following:</b>
<b>CHEM 1301</b> Foundations of Chemistry	<b>HDCS 3300</b> Organizational Decisions in Technology
<b>MATH 1431</b> Calculus I	<b>TLIM 3340</b> Organizational Leadership and Supervision

### ELECTIVE COURSES

#### 3 credit hours free electives

#### 12 credit hours approved electives, selected from the following:

<b>ELET 4300</b> Unix Operating System
<b>ELET 4302</b> Data Communication Systems
<b>ELET 4309</b> Object-Oriented Applications Programming
<b>ELET 4315</b> Telecommunications
<b>ELET 4325</b> Advanced Microcomputer Networks
<b>ELET 4327</b> Optical Circuits
<b>ELET 4332</b> Physiological Systems Modeling and Simulation
<b>ELET 4350</b> Overview of Computational Health Informatics
<b>ELET 4351</b> Biomedical Data Mining
<b>ELET 4352</b> Computational Tools for Technology
<b>ELET 4354</b> Biomedical Image Analysis
<b>ELET 4355</b> Biomedical Signal Analysis
<b>ELET 4360</b> Sustainable and Resilient Technology Development

# CONSTRUCTION MANAGEMENT **BS**

The Construction Management program provides the ultimate balance of construction, business, and engineering courses. The program emphasizes the critical skills that are highly sought in today and tomorrow's job markets. Graduates of the CM program are prepared to enter rewarding professions such as project managers, field operations engineers, construction estimators, and construction planners.

The objective of Construction Management program is to provide graduates with knowledge and skills that are valued by commercial, industrial and heavy civil sectors of the construction industry. Graduates gain knowledge of construction materials and methods, structural systems, soils, site development, surveying, contract administration, codes, plans and specifications, planning, estimating, scheduling, and evaluating project performance. The curriculum provides fundamental and advanced coursework that incorporates current standards and technology for managing and providing quality construction. Software is applied in curriculum courses to prepare students for the utilization of computer applications in construction management. The four-year program is accredited by The American Council for Construction Education (ACCE).

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

**CNST 1361** Construction Management I  
**CNST 2351** Construction Estimating I  
**CNST 3185** Construction Experience  
**CNST 3265** Construction Layout and Site Development  
**CNST 3301** Construction Equipment and Methods  
**CNST 3331** Construction of Planning and Scheduling  
**CNST 3355** Strength of Construction Materials  
**CNST 3155** Construction Materials and Testing  
**CNST 3372** Soil Mechanics and Foundations  
**CNST 4220** Comprehensive Construction Management and Emerging Practices  
**CNST 4302** Construction Law and Ethics  
**ACCT 2301** Principles of Financial Accounting  
**ACCT 2302** Principles of Managerial Accounting  
**COMM 1332** Fundamentals of Public Speaking  
**ECON 2304/2305** Micro or Macroeconomics Principles  
**BUSI 4350** Business Law and Ethics  
**MATH 1313** Finite Math with Applications  
**MATH 1330** Precalculus

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**MATH 1431** Calculus I  
**MATH 2311** Introduction to Probability and Statistics  
**PHYS 1301** Introductory General Physics I  
**PHYS 1302** Introductory General Physics II  
**OR**  
**GEOL 1330** Physical Geology  
**PHYS 1102** General Physics II Lab

### PROCESS AND INDUSTRIAL TRACK

**CNST 1315** Project Drawings and Graphics  
**CNST 1325** Process and Industrial Construction  
**CNST 2325** Process and Industrial Subsystems  
**CNST 2345** Contract Documents for Capital Projects  
**CNST 3210** Safety for Industrial Projects  
**CNST 3365** Cost Estimating Capital Projects  
**CNST 4315** Steel Construction  
**CNST 4335** Capital Projects Development  
**CNST 4345** Reinforced Concrete Structures  
**CNST 4385** Field Operations for Capital Projects

### COMMERCIAL CONSTRUCTION TRACK

**CNST 1301** Construction Materials and Methods  
**CNST 1330** Graphics I  
**CNST 2321** Mechanical and Electrical Systems  
**CNST 2341** Construction Documents  
**CNST 3205** Construction Safety Management  
**CNST 3351** Construction Estimating II  
**CNST 4311** Structural Steel and Timber Construction  
**CNST 4331** Construction Management II  
**CNST 4341** Project Controls  
**CNST 4381** Reinforced Concrete and Building Codes

### ELECTIVE COURSES

**6 credit hours of approved business electives, selected from the following:**

**MANA 3335** Introduction to Organizational Behavior and Management  
**MARK 3336** Introduction to Marketing  
**FINA 3332** Principles of Financial Management  
**SCM 3301** Service and Manufacturing Operations  
**ENTR 3310** Entrepreneurship  
**ENTR 3312** Corporate Entrepreneurship



# ELECTRICAL POWER ENGINEERING TECHNOLOGY **BS**

Earning a degree in Electrical Power Engineering Technology provides you with the right combination of skills for designing, analyzing, and improving computer-based power generation, delivery, and end-user systems. In addition to studying electrical motors and generators, computer-based controls, and alternative energy sources, you will learn about electrical power generating transmission and distribution systems, electrical power protection systems, and power electronics that increase the reliability and efficiency of electrical energy systems.

The goal of the Electrical Power Engineering Technology program is to provide students with a high quality applications-oriented undergraduate education based on state-of-the-art technological equipment associated with electrical technology. This goal is achieved through several objectives such as continuing to update specific courses in the program to ensure relevance to the latest industrial changes, supporting the development of appropriate computer facilities, promoting the integration of advanced technology in all courses, and encouraging professional growth and development of the faculty. The program is designed to satisfy the educational needs of the urban Houston community by providing a climate that fosters self-awareness, personal growth, and a desire for lifelong learning.

Degree Requirements: **124**  
semester hours

## FOUNDATION COURSES

**ELET 1400** Circuit Theory and Lab I  
**ELET 1401** Circuit Theory and Lab II  
**ELET 2301** Poly-Phase Circuits and Transformers  
**ELET 2101** Poly-Phase Circuits and Transformers Lab  
**ELET 2303** Digital Systems  
**ELET 2103** Digital Systems Lab  
**ELET 2305** Semiconductor Devices and Circuits  
**ELET 2105** Semiconductor Devices and Circuits Lab  
**ELET 3301** Linear Systems Analysis  
**ELET 3405** Microprocessor Architecture  
**ELET 3307** Electrical Machines and Controls  
**ELET 3107** Electrical Machines and Controls Lab  
**ELET 3312** Programmable Logic Controllers & Motor Control Systems  
**ELET 3112** Rotating Machine Controls Lab  
**ELET 4303** Computer-Based Power Distribution and Transmission  
**ELET 4305** Senior Design in Electrical Power Engineering Technology  
**ELET 4317** Computer-Based Electrical System Protection and Safety  
**ELET 4319** Electrical Power Systems and Industry Practices  
**ELET 4326** Power Converter Circuits  
**ELET 4126** Power Converter Circuits Lab

**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**MECT 1365** Elements of Materials and Processes  
**MECT 3341** Computer-Aided Drafting  
**OR**  
**MECT 4188** Ethics in Engineering Technology  
**PHYS 1301** Introductory General Physics I  
**PHYS 1101** General Physics I Lab  
**PHYS 1302** Introductory General Physics II  
**PHYS 1102** General Physics II Lab  
**TLIM 3363** Technical Communicatitons

### **ONE of the following:**

**MATH 3307** Statistical Applications  
**MATH 3321** Engineering Mathematics

### **ONE of the following:**

**TLIM 3340** Organizational Leadership and Supervision  
**HDCS 3300** Organizational Decisions in Technology

## ELECTIVE COURSES

**3 credit hours** free electives

### **12 credit hours approved electives, selected from the following:**

**ELET 4300** Unix Operating System  
**ELET 4302** Data Communication Systems  
**ELET 4309** Object-Oriented Applications Programming  
**ELET 4315** Telecommunications  
**ELET 4325** Advanced Microcomputer Networks  
**ELET 4327** Optical Circuits  
**ELET 4332** Physiological Systems Modeling and Simulation  
**ELET 4350** Overview of Computational Health Informatics  
**ELET 4351** Biomedical Data Mining  
**ELET 4352** Computational Tools for Technology  
**ELET 4354** Biomedical Image Analysis  
**ELET 4355** Biomedical Signal Analysis  
**ELET 4360** Sustainable and Resilient Technology Development

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# MECHANICAL ENGINEERING TECHNOLOGY **BS**

The Mechanical Engineering Technology program offers advanced teaching and research laboratories with courses in computer aided engineering, biomedical systems, advanced material design, manufacturing, systems integration, oil and gas applications, energy and efficient project management. Students gain highly developed expertise in design, analysis and manufacturing mechanical systems.

This program includes courses that are directed at both computer-aided manufacturing and computer-aided design and drafting. Individuals interested in manufacturing technology apply fundamental principles of mechanical design and manufacturing processes to new and existing manufacturing systems. Courses focus on manufacturing planning and management, automated manufacturing systems, quality control, and robotics. Computer-aided design and drafting is an essential component of the design procedure; courses focus on computer graphics and applied mechanical design.

The Mechanical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET.

Degree Requirements: **124**  
semester hours

## FOUNDATION COURSES

**MECT 1330** Engineering Graphics  
**MECT 1364** Materials and Processes I  
**MECT 2354** Introduction to Mechanics  
**MECT 3318** Fluid Mechanics Applications  
**MECT 3118** Fluid Mechanics Applications Lab  
**MECT 3331** Applied Thermodynamics  
**MECT 3342** Elements of Plant Design  
**MECT 3355** Strength of Materials  
**MECT 3155** Strength of Materials Lab  
**MECT 3358** Dynamics of Mechanisms  
**MECT 3360** Automated Manufacturing Systems  
**MECT 3365** Computer-Aided Design I  
**MECT 3367** Quality Control Technology  
**MECT 4188** Ethics in Engineering Technology  
**MECT 4331** Heat Transfer Applications  
**MECT 4372** Materials Technology  
**MECT 4172** Materials Technology Lab  
**MECT 4275** Senior Design Project I  
**MECT 4276** Senior Design Project II

**CHEM 1301** Foundations of Chemistry  
**CHEM 1101** Foundations of Chemistry Lab  
**ELET 2300** Introduction to C++ Programming  
**ELET 2307** Electrical-Electronic Circuits  
**MATH 1330** Precalculus  
**MATH 1431** Calculus I  
**MATH 1432** Calculus II  
**PHYS 1301** Introductory General Physics I  
**PHYS 1101** General Physics I Lab  
**PHYS 1302** Introductory General Physics II  
**PHYS 1102** General Physics II Lab  
**TELS 3363** Technical Communications

### **ONE of each of the following:**

**TELS 3340** Organizational Leadership and Supervision  
**HDCS 3300** Organizational Decisions in Technology

## ELECTIVE COURSES

**3 credit hours** free electives

**12 credit hours of computer-aided design and manufacturing electives, selected from the following:**

**MECT 3362** Industrial Work Measurement  
**MECT 3330** Advanced Engineering Graphics  
**MECT 3364** Materials and Processes II  
**MECT 3366** Learn Manufacturing  
**MECT 3368** Economic Analysis of Technology  
**MECT 4323** Applications in Stress Analysis  
**MECT 4341** Materials Selection and Management  
**MECT 4345** Fundamentals and Applications of Fuel Cell  
**MECT 4350** Principles in Mechatronics  
**MECT 4360** Fundamentals of Biomechanics  
**MECT 4364** Smart Manufacturing Systems Design  
**MECT 4365** Computer-Aided Design II  
**MECT 4367** Industrial Maintenance and Reliability  
**MECT 4368** Simulation of Manufacturing Systems  
**MECT 4384** Manufacturing Systems Control  
**MECT 3341** Computer-Aided Drafting I  
**MECT 4326** Fundamentals of Offshore Systems  
**MECT 4328** Fundamentals of Pipeline Design  
**MECT 4330** Valve Design  
**MECT 4332** Fundamentals of Drilling Technology  
**MECT 4337** Downhole Drilling Tools and Technology

# ORGANIZATIONAL LEADERSHIP & SUPERVISION **BS**

The Organizational Leadership and Supervision program focuses on providing individuals with a competitive advantage when moving into leadership and supervisory roles. Students gain the tools and knowledge to learn about leadership, the importance of organizational vision and values, developing human resources, and managing technological resources in corporate, government, or community organizations. In addition to leadership, you will learn skills in goal-setting, time management, and verbal and visual communication using real-world applications.

Graduates frequently obtain positions as regional sales managers, fire and safety coordinators, assistant HR managers, superintendents, operating engineers, health educators, and field inspectors, with an average starting salary of \$64,500.

The Organizational Leadership and Supervision program offers multiple areas of directed emphasis, such as Digital Media, Supply Chain and Logistics, Computer Information Systems, Electrical Power Engineering Technology, as well as a variety of others from the different Colleges.

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

**DIGM 3353** Visual Communications Technology  
**SCLT 2362** Introduction to Logistics Technology  
**PHIL 1321** Logic I  
**TLIM 3340** Organizational Leadership and Supervision  
**TLIM 3345** Human Resources in Technology  
**TLIM 3355** Project Management Principles  
**TLIM 3365** Team Leadership  
**TLIM 4341** Production and Service Operations  
**TLIM 4342** Quality Improvement Methods  
**TLIM 4371** Leading Change in the Workplace  
**TLIM 4372** Proposal and Project Writing  
**TLIM 4390** Current Issues in Leadership & Innovation  
**TMTH 3360** Applied Technical Statistics  
**TLIM 4378** Senior Project  
**MATH 1310** College Algebra  
**MATH 1313** Finite Math with Applications  
**TLIM 3363** Technical Communications

#### **Directed Emphasis:**

**36 credit hours** of courses in directed emphasis

### DIRECTED TECHNOLOGY EMPHASIS EXAMPLE

**DIGM 1350** Graphics for Digital Media  
**DIGM 3350** Graphic Communication Production Processes  
**DIGM 3351** Individualized Communication Processes  
**DIGM 3152** Graphic Production Process Control II Lab  
**DIGM 4372** Graphic Communication Output Lab  
**DIGM 4373** Photographic Tone and Color Reproduction  
**DIGM 4376** Integrated Media  
**DIGM 4390** Current Issues in Digital Media  
**HDCE 3369** Entrepreneurship  
**SCLT 2380** Distribution Channels  
**SCLT 3381** Industrial and Consumer Sales  
**SCLT 3384** Logistics Tech and Processes  
**DIGM 4396** Internship in Digital Media

\* Students may choose from a variety of other courses across the College's to form their directed emphasis.



[uh.edu/technology](http://uh.edu/technology)



# SUPPLY CHAIN & LOGISTICS TECHNOLOGY **BS**

Supply Chain and Logistics Technology is managing (planning and executing) the flow of materials, their transformation into finished goods, and their ultimate delivery as finished goods to the final buyer. Its primary areas of operations include inventory, transportation, production, and procurement and the information flow to facilitate these activities. With a BS in Supply Chain and Logistics Technology, students make ideal candidates for transportation coordinators, category analysts, customer service supervisors, purchasing agents, doc supervisors, Directors of logistics, warehouse managers, distribution managers, transportation managers, project managers, and Directors of regional or country groups, with opportunities to move into positions such as VPs of global logistics, VPs of supply chain, or Directors of global supply chain operations.

Through classroom work and the real-world experience gained through internships and senior practicum, students will develop strong competencies in technical aspects of production, procurement, transportation, distribution, information management, transactions, and quality; conceptual skills associated with of marketing, customer service, least total cost, asset management, process integration, globalization of trade; and interpersonal skills such as leadership, project management, and collaboration.

## Degree Requirements: **120** semester hours

### FOUNDATION COURSES

**SCLT 2362** Introduction to Logistics Technology  
**SCLT 2380** Distribution Channels  
**SCLT 3384** Logistics Technology and Processes  
**SCLT 3385** Transportation Economics Policy  
**SCLT 3387** Procurement  
**SCLT 3389** Transportation Law  
**SCLT 4312** Inventory and Materials Handling  
**SCLT 4375** Global Supply Chain  
**SCLT 4380** Quality Systems  
**SCLT 4387** Financial Evaluation for Supply Chain Management  
**SCLT 4389** Practicum in Supply Chain & Logistics Technology  
**ACCT 2301** Principles of Financial Accounting  
**COMM 3356** Business and Professional Communications  
**DIGM 3353** Visual Communications Technology  
**ECON 2304** Microeconomic Principles  
**ECON 2305** Macroeconomic Principles  
**ITEC 1301** Introduction to Computer Application Technology

**MATH 1313** Finite Math  
**MATH 1311** Elementary Mathematical Modeling  
**MATH 1314** Calculus for Business  
**TLIM 3360** Law and Ethics in Technology and Innovation  
**TMTH 3360** Applied Technical Statistics

#### **ONE of each of the following:**

**TLIM 3340** Organizational Leadership and Supervision  
**HDCS 3300** Organizational Decisions in Technology

### OPERATIONS TRACK

**SCLT 3381** Industrial and Consumer Sales  
**MECT 1365** Elements of Materials and Processes  
**TLIM 4341** Production and Service Operations  
**9 credit hours** approved electives

### SYSTEMS MANAGEMENT TRACK

**CIS 2332** Information Technology Hardware and Systems Software  
**CIS 2334** Information Systems Application  
**CIS 3343** Info Systems Analysis & Design  
**CIS 3365** Database Management  
**6 credit hours** approved electives

### GLOBAL LOGISTICS TRACK


**SCLT 3340** Geography for Global Supply Chain  
**SCLT 3375** Maritime Operations  
**SCLT 3376** Global Trade Intermediaries  
**9 credit hours** approved electives

### DIRECTED EMPHASIS TRACK

**18 Hours** of transfer coursework related to Supply Chain may be applied by department approval.

### ELECTIVE COURSES

See [uh.edu/technology](http://uh.edu/technology) for elective course listings



Decarbonization and the energy transition require many workers in the incumbent energy industry to transform their knowledge base and skills. Upskilling and reskilling programs that address the skills gap and offer opportunities for continued education are critical for workforce development and social equity.

As The Energy University, UH is committed to shepherding an efficient and innovative energy transition, and to that end has designed micro-credentialing courses for rising seniors in related fields and/or energy-industry professionals with the mission to upskill, reskill and prepare these individuals to address the myriad of global energy challenges facing society today and tomorrow.

# **MICRO-CREDENTIALING**

## **PROGRAMS DEVELOPED BY UH ENERGY**



# CCUS EXECUTIVE EDUCATION COURSE

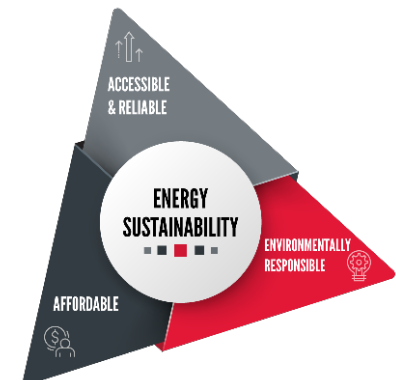
Carbon capture, utilization and storage (CCUS) is recognized by the International Energy Agency and the U.S. Department of Energy as a necessity for the de-carbonization of our society. Markets such as oil and gas, petrochemicals, electric power, hydrogen, and the circular plastics economy all ride on the shoulders of the broad commercial deployment of CCUS. If you are working in industry or if energy is a significant part of your activities and interests, this course is a must. Participants will understand the technology and economics of the value proposition impacts - as well as the challenges to overcome.

The material developed for this course was partially paid for with federal funding from the Department of the Treasury through the State of Texas under the Resources, and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act). The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of the State of Texas or the Department of the Treasury.

## **OVERVIEW:**

**Course length:** 12 weeks

**Course format:** A self-paced online course with 8 learning modules and 4 live Zoom meetings to interact with the instructors - dates to be announced. It will also include networking opportunities.





# THE HYDROGEN ECONOMY

With the energy industry going through dynamic transition, energy professionals – current and future – need to be informed and equipped to meet challenges of today and tomorrow. The Hydrogen Economy is an essential program that provides key insights about this key component of the evolving global energy system. Designed and presented by industry leaders and accomplished faculty from the University of Houston, the program offers a unique balance of industrial expertise and academic rigor.

It examines hydrogen's production, transportation, safety, use, and commercial opportunities, and considers both onshore and offshore applications. It also includes real time review meetings with instructors, and a capstone project to consolidate the learnings, to better equip students with skills, knowledge and expertise to thrive in the hydrogen economy.

The Hydrogen Economy is offered jointly by the University of Houston and the American Institute of Chemical Engineers. Successful candidates will receive digital badges from UH Energy and certificates from AIChE for each of the three course modules.

## Course format:

The Hydrogen Economy is a combined synchronous/asynchronous package the program is offered in 15-hour modules, each module taking place over a three-week period. Digital badges are awarded for each module, and a set of three badges earns a "Silver Belt" from UH Energy. Successful students will also receive a certificate of completion from AIChE.







# ROBOTICS IN ENERGY

There is a growing demand for robotics systems in production, inspection, and maintenance within the energy industry – both onshore and offshore – driven by the desire to minimize the risk of human exposure to hazardous environments and reduce operating costs. However, a significant gap exists between the current workforce's expertise and the rapidly evolving technologies. Deploying robots in inspecting, monitoring, and maintaining energy assets requires an in-depth understanding of robotic systems, including the ability to identify a specific use case, assess the impact of robotics on the business, and maintain the value of the robot to ensure it continues to operate safely and profitably.

To address these challenges, the Subsea Systems Institute (SSI), collaborating with SPRINT Robotics, has developed a Robotics in Energy course focusing on safety, reliability, business impact, and use cases. The micro-credential course provides participants with a comprehensive understanding of the robot integration process, including economic evaluation and qualification. It also includes an evaluation tool/protocol for risk and safety management, enabling participants to assess the feasibility of incorporating robots into their working environment.

## **Course Overview:**

### ***Module 1: Technology awareness (Online)***

Robotics in extreme environments:  
Downhole, Tank & Confined space, Extreme temperature & pressure  
Subsea & Underwater robotics  
AI & Digital twin for inspection

### **Module 2: Robotic integration & Business management (Online & In-person)**

Asset owner  
Operator and service provider

### **Module 3: Safety & Risk assessment and management (Online & In-person)**

Processes and tools for RAMS (Reliability, Availability, Maintainability and Safety) achievement





Division of Energy and Innovation  
UNIVERSITY OF **HOUSTON**

