WHAT’S IN THIS ISSUE
Message from the Chief Energy Officer

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

About UH Energy

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

Energy Sectors and Related Careers

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

UHin4

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

Undergraduate Programs

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

Graduate and Professional Programs

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

Micro-Credentialing Programs

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

Student Resources

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

How to Apply

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

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>Message from the Chief Energy Officer</td>
</tr>
<tr>
<td>10</td>
<td>Energy Sectors and Related Careers</td>
</tr>
<tr>
<td>12</td>
<td>UHin4 - Four Year Graduation Plan</td>
</tr>
<tr>
<td>14</td>
<td>Undergraduate Programs</td>
</tr>
<tr>
<td>15</td>
<td>Gerald D. Hines College of Architecture</td>
</tr>
<tr>
<td>17</td>
<td>Architecture, BArch</td>
</tr>
<tr>
<td>18</td>
<td>Interior Architecture, BS</td>
</tr>
<tr>
<td>19</td>
<td>Industrial Design, BS</td>
</tr>
<tr>
<td>20</td>
<td>Environmental Design, BS</td>
</tr>
<tr>
<td>21</td>
<td>C.T. Bauer College of Business</td>
</tr>
<tr>
<td>23</td>
<td>Accounting, BBA</td>
</tr>
<tr>
<td>24</td>
<td>Oil &amp; Gas Accounting Undergraduate Certificate</td>
</tr>
<tr>
<td>25</td>
<td>Finance - Global Energy Management, BBA</td>
</tr>
<tr>
<td>26</td>
<td>Finance - Global Energy Management, Professional Program, BBA</td>
</tr>
<tr>
<td>27</td>
<td>Supply Chain Management, BBA</td>
</tr>
<tr>
<td>28</td>
<td>Energy Supply Management Undergraduate Certificate</td>
</tr>
<tr>
<td>29</td>
<td>Cullen College of Engineering</td>
</tr>
<tr>
<td>31</td>
<td>Chemical Engineering, BSChE</td>
</tr>
<tr>
<td>32</td>
<td>Civil Engineering, BSCE</td>
</tr>
<tr>
<td>33</td>
<td>Electrical Engineering, BSEE</td>
</tr>
<tr>
<td>34</td>
<td>Industrial Engineering, BSIE</td>
</tr>
<tr>
<td>35</td>
<td>Mechanical Engineering, BSME</td>
</tr>
<tr>
<td>36</td>
<td>Petroleum Engineering, BSEPETR</td>
</tr>
<tr>
<td>37</td>
<td>The Honors College</td>
</tr>
<tr>
<td>39</td>
<td>Honors Engineering Program, BS</td>
</tr>
<tr>
<td>39</td>
<td>Energy &amp; Sustainability Minor</td>
</tr>
<tr>
<td>41</td>
<td>College of Liberal Arts and Social Sciences (CLASS)</td>
</tr>
<tr>
<td>43</td>
<td>Economics, BS</td>
</tr>
<tr>
<td>45</td>
<td>College of Natural Sciences and Mathematics (NSM)</td>
</tr>
<tr>
<td>47</td>
<td>Chemistry, BS</td>
</tr>
<tr>
<td>48</td>
<td>Computer Science, BS</td>
</tr>
<tr>
<td>49</td>
<td>Environmental Sciences, BS</td>
</tr>
<tr>
<td>50</td>
<td>Geology, BS</td>
</tr>
<tr>
<td>51</td>
<td>Geophysics, BS</td>
</tr>
<tr>
<td>52</td>
<td>Physics, BS</td>
</tr>
<tr>
<td>53</td>
<td>College of Technology</td>
</tr>
<tr>
<td>55</td>
<td>Biotechnology, BS</td>
</tr>
<tr>
<td>56</td>
<td>Computer Engineering Technology, BS</td>
</tr>
<tr>
<td>57</td>
<td>Construction Management, BS</td>
</tr>
<tr>
<td>58</td>
<td>Electrical Power Engineering Technology, BS</td>
</tr>
<tr>
<td>59</td>
<td>Mechanical Engineering Technology, BS</td>
</tr>
<tr>
<td>60</td>
<td>Organizational Leadership &amp; Supervision, BS</td>
</tr>
<tr>
<td>61</td>
<td>Supply Chain &amp; Logistics Technology, BS</td>
</tr>
</tbody>
</table>
### Graduate and Professional Programs

#### Gerald D. Hines College of Architecture
- Architecture, MS
- Industrial Design, MS

#### C.T. Bauer College of Business
- Accounting, MSAccy
- Economics of the Energy Value Chain, Certificate
- Energy Finance, Certificate
- Energy Investment Analysis, Certificate
- Energy Risk Management, Certificate
- Global Energy Management, MS
- Oil & Gas Accounting, Certificate
- Supply Chain Management, MS
- Supply Chain Management Program (DISC), Certificate

#### Cullen College of Engineering
- Aerospace Engineering, MS
- Chemical Engineering, MChE | MS | PhD

#### The UH Law Center
- Environment, Energy & Natural Resource Law, LLM

#### Hobby School of Public Affairs
- Public Policy, MPP

### Civil Engineering, MSCE | PhD
### Computer & Systems Engineering, MS
### Electrical Engineering, MS | MEE | PhD
### Industrial Engineering, MSIE | MIE | PhD
### Materials Science & Engineering, MS | PhD
### Mechanical Engineering, MS | PhD
### Petroleum Engineering, MS | PhD
### Space Architecture, MS
### Subsea Engineering, MS
College of Natural Sciences and Mathematics (NSM)

97 College of Natural Sciences and Mathematics (NSM)
98 Applied Mathematics, MS
99 Atmospheric Sciences, MS | PhD
100 Chemistry, MS | PhD
101 Computer Science, MS | PhD
102 Geographic Information Systems, Certificate
103 Geology, MS | PhD
104 Geophysics, MS | PhD
105 Hydrogeology, Certificate
106 Professional Geosciences Master’s Degree Program - Geology, MS
107 Professional Geosciences Master’s Degree Program - Geophysics, MS
108 Physics, MS | PhD

College of Technology

109 Biotechnology, MS
110 Construction Management, MS
111 Engineering Technology, MS
112 Petroleum Technology, Certificate
113 Supply Chain and Logistics Technology, MS
114 Technology Project Management, MS

Mico-Credentialing Programs

115 Energy Data Analytics Program
116 Sustainable Energy Development Program

Student Resources

91 - Public Policy

How to Apply

119 Student Resources
121 How to Apply
THE ENERGY UNIVERSITY
Student success is a critical mission for the University of Houston led by the Office of the President. This mission hinges on outstanding classroom and on-line education as well as carefully planned and directed student advising including the highly successful UHin4 program. Energy-related educational programs, housed in eight different colleges, are directly connected to the education of 40 percent of the students at UH. The education programs at UH span from undergraduate, graduate, and professional degree programs, undergraduate minors, graduate certificates, and continuing education programs.

Many of the energy-related educational opportunities lie at the intersection of different disciplines, and UH Energy, operating in the Office of the President, has brought focus and helped to grow some of these programs as complements to the outstanding discipline-centered education programs. This guide provides a comprehensive list of all our energy-related education programs and provides advising guidance for students, advisors and parents interested in UH’s energy education programs.

Ramanan Krishnamoorti
Chief Energy Officer
University of Houston
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.

MEET THE TEAM

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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

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www.uh.edu/energy
www.uh.edu/president
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LAUNCH YOUR EDUCATION

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’ on page 116 for information on how and where you can access the official University of Houston undergraduate and graduate catalogs online.

FUEL YOUR CAREER
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 consumers look for more options to power their lives, innovative thinkers, researchers and inventors will be at the leading edge of 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

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
UNDERGRADUATE PROGRAMS
Gerald D. Hines
College of Architecture and Design

17 Architecture, BArch
18 Interior Architecture, BS
19 Industrial Design, BS
20 Environmental Design, BS
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 Program 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
- HDCS 1300 Human Ecosystems and Technological Change
- HDCS 3300 Organizational Decisions
- MUSI 3300 Listening to Music Masterworks

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

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
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

**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

**COURSES**

- 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
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 Programming 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
23 Accounting, BBA
24 Oil & Gas Accounting, Undergraduate Certificate
25 Finance - Global Energy Management Track, BBA
26 Finance - Global Energy Management, Professional Program, BBA
27 Supply Chain Management, BBA
28 Energy Supply Chain Management Undergraduate Certificate
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.
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

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.

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.
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)
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 1311+1111 & CHEM 1311+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 (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

BUSB 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.
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.

Certificate 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.
31 Chemical Engineering, BSChE
32 Civil Engineering, BSCE
33 Electrical Engineering, BSEE
34 Industrial Engineering, BSIE
35 Mechanical Engineering, BSME
36 Petroleum Engineering, BSPetr
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**

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<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>CHEM 1331</td>
<td>Fundamentals of Chemistry I</td>
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<td>CHEM 1111</td>
<td>Fundamentals of Chemistry I Lab</td>
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<td>CHEE 2331</td>
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<td>CHEE 2332</td>
<td>Chemical Engineering Thermodynamics I</td>
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<td>CHEE 3300</td>
<td>Materials Science and Engineering I</td>
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<td>CHEE 3321</td>
<td>Analytical Methods for Chemical Engineers</td>
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<td>CHEE 3333</td>
<td>Chemical Engineering Thermodynamics II</td>
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<td>CHEE 3334</td>
<td>Statistical/Numerical Techniques for Chemical Engineers</td>
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<td>Fluid Mechanics for Chemical Engineers</td>
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<td>Process Modeling and Control</td>
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<td>Biological and Physical Chemistry</td>
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<td>CHEE 4321</td>
<td>Chemical Engineering Design I</td>
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<td>CHEE 4361</td>
<td>Chemical Engineering Practices</td>
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<td>CHEE 4322</td>
<td>Chemical Engineering Design II</td>
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<td>CHEE 4367</td>
<td>Chemical Reaction Engineering</td>
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<td>ENGI 1100</td>
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<td>Computing and Problem Solving for Engineers</td>
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<td>ENGI 2304</td>
<td>Technical Communications for Engineers</td>
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<td>MATH 1431</td>
<td>Calculus I</td>
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<td>MATH 1432</td>
<td>Calculus II</td>
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<td>MATH 2433</td>
<td>Calculus III</td>
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<tr>
<td>PHYS 1321</td>
<td>University Physics I</td>
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**ELECTIVE COURSES**

- 3 credit hours chemistry elective
- 3 credit hours advanced science elective
- 6 credit hours technical electives
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
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 1321 University Physics I
- PHYS 1121 University Physics Lab II
- PHYS 1322 University Physics II
- PHYS 1122 University 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 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

ELECTIVE COURSES

3 credit hours technical elective

MECE 3400  Introductions to Mechanics
PHYS 1321  University Physics I
PHYS 1322  University Physics II
MECHANICAL ENGINEERING

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 higher 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.
Petroleum engineering offers the full spectrum of career opportunities—whether working for large multinational corporations or smaller independent oil companies, or even opportunities for the development of new companies and enterprises.

The industry continues to re-invent itself and in recent years there have been major new developments in the horizontal drilling, hydraulic fracturing, production and stimulation, and the production of deep, tight gas formations, to mention a few. Such developments have invigorated the US and global petroleum production industry and will have an important impact in meeting global energy challenges in the future.

Historically, compensation in the petroleum industry has been quite high and in recent years it has led all B.S. degrees, due to the ever increasing importance of oil and gas and energy in general and due to the large numbers of retirements among currently practicing petroleum engineers.

Degree Requirements: 127 semester hours

FOUNDATION COURSES
PETR 1111  Introduction to Petroleum Engineering
PETR 2311  Reservoir Petrophysics
PETR 2111  Petroleum Petrophysics Lab
PETR 2313  Reservoir Fluids
PETR 3315  Introduction to Well Logging
PETR 3362  Reservoir Engineering I
PETR 3372  Petroleum Production Operation
PETR 3318  Drilling Engineering I
PETR 3321  Petroleum Pressure Transient Testing
PETR 3310  Petroleum Production Economics
PETR 4301  Reservoir Characterization and Modeling
PETR 4311  Capstone Senior Project I
PETR 4312  Capstone Senior Project II
CHEE 3363  Fluid Mechanics for Chemical Engineers
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
GEOL 1330  Physical Geology
GEOL 1130  Physical Geology Lab
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 3400  Introduction to Mechanics
PHYS 1321  University Physics I
PHYS 1322  University Physics II

ELECTIVE COURSES
9 credit hours technical elective
3 credit hours geoscience elective
THE HONORS COLLEGE

39 Honors Engineering Program, BS
Energy & Sustainability Minor
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.
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.
COLLEGE OF
LIBERAL ARTS
AND SOCIAL SCIENCES

43 Economics, BS
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.
**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.
COLLEGE OF
NATURAL SCIENCES
AND MATHEMATICS

47 Chemistry, BS
48 Computer Science, BS
49 Environmental Sciences, BS
50 Geology, BS
51 Geophysics, BS
52 Physics, BS
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 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

**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

**ONE of the following:**

- MATH 2331  Linear Algebra
- MATH 3321  Engineering Mathematics
Environmental Sciences

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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>GEOL 1330</td>
<td>Physical Geology</td>
</tr>
<tr>
<td>GEOL 1130</td>
<td>Physical Geology Lab</td>
</tr>
<tr>
<td>BIOL 1361</td>
<td>Introduction to Biological Science I</td>
</tr>
<tr>
<td>BIOL 1161</td>
<td>Introduction to Biological Science I Lab</td>
</tr>
<tr>
<td>BIOL 1362</td>
<td>Introduction to Biological Science II</td>
</tr>
<tr>
<td>BIOL 1162</td>
<td>Introduction to Biological Science II Lab</td>
</tr>
<tr>
<td>CHEM 1331</td>
<td>Fundamentals of Chemistry I</td>
</tr>
<tr>
<td>CHEM 1111</td>
<td>Fundamentals of Chemistry I Lab</td>
</tr>
<tr>
<td>CHEM 1332</td>
<td>Fundamentals of Chemistry II</td>
</tr>
<tr>
<td>CHEM 1112</td>
<td>Fundamentals of Chemistry II Lab</td>
</tr>
<tr>
<td>MATH 1431</td>
<td>Calculus I</td>
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<tr>
<td>MATH 1432</td>
<td>Calculus II</td>
</tr>
<tr>
<td>MATH 2433</td>
<td>Calculus III</td>
</tr>
<tr>
<td>MATH 3339</td>
<td>Statistics for the Sciences</td>
</tr>
<tr>
<td>PHYS 1321</td>
<td>University Physics I</td>
</tr>
<tr>
<td>PHYS 1121</td>
<td>University Physics I Lab</td>
</tr>
<tr>
<td>PHYS 1322</td>
<td>University Physics II</td>
</tr>
<tr>
<td>PHYS 1122</td>
<td>University Physics II Lab</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL GEOSCIENCE TRACK**

**6 credit hours required courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 3340</td>
<td>Geologic Field Methods</td>
</tr>
<tr>
<td>GEOL 3370</td>
<td>Mineralogy</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 3331</td>
<td>Environmental Geology</td>
</tr>
<tr>
<td>GEOL 3338</td>
<td>Environmental Hydrology</td>
</tr>
<tr>
<td>GEOL 4331</td>
<td>Geospatial Analysis and Applications</td>
</tr>
<tr>
<td>GEOL 4334</td>
<td>Environmental Data Analysis</td>
</tr>
<tr>
<td>GEOL 4356</td>
<td>Environmental Science Field Research</td>
</tr>
<tr>
<td>GEOL 4365</td>
<td>Environmental Geochemistry</td>
</tr>
<tr>
<td>GEOL 4367</td>
<td>Geochemical Reaction Modeling</td>
</tr>
</tbody>
</table>

**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:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 3342</td>
<td>Principles of Air Pollution</td>
</tr>
<tr>
<td>GEOL 3378</td>
<td>Principles of Atmospheric Science</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 3382</td>
<td>Atmospheric Chemistry</td>
</tr>
<tr>
<td>GEOL 4334</td>
<td>Environmental Data Analysis</td>
</tr>
<tr>
<td>GEOL 4346</td>
<td>Air Pollution Meteorology</td>
</tr>
<tr>
<td>GEOL 4343</td>
<td>Atmospheric Instrumentation</td>
</tr>
<tr>
<td>GEOL 4356</td>
<td>Environmental Science Field Research</td>
</tr>
<tr>
<td>GEOL 4336</td>
<td>Atmospheric Radiation</td>
</tr>
<tr>
<td>GEOL 4340</td>
<td>Aerosols and Climate</td>
</tr>
</tbody>
</table>

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

**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
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
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

<table>
<thead>
<tr>
<th>FOUNDATION COURSES</th>
<th>ELECTIVE COURSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 1330  Physical Geology</td>
<td>12 credit hours of advanced geophysics electives, selected from the following:</td>
</tr>
<tr>
<td>GEOL 1130  Physical Geology Lab</td>
<td>GEOL 3383  Remote Sensing</td>
</tr>
<tr>
<td>GEOL 3340  Geologic Field Methods</td>
<td>GEOL 4332  Applications of GPS and LIDAR</td>
</tr>
<tr>
<td>GEOL 3345  Structural Geology</td>
<td>GEOL 4379  Groundwater and Engineering Geophysics</td>
</tr>
<tr>
<td>GEOL 3145  Structural Geology Lab</td>
<td>GEOL 4385  Introduction to Marine Geophysics</td>
</tr>
<tr>
<td>GEOL 3350  Stratigraphy</td>
<td></td>
</tr>
<tr>
<td>GEOL 3150  Principles of Stratigraphy Laboratory</td>
<td></td>
</tr>
<tr>
<td>GEOL 3325  Rocks and Minerals</td>
<td>3 credit hours of advanced geoscience electives, selected from the following:</td>
</tr>
<tr>
<td>GEOL 4330  Introduction to Geophysics</td>
<td>GEOL 3331  Environmental Geology</td>
</tr>
<tr>
<td>GEOL 4355  Geophysical Field Camp</td>
<td>GEOL 3338  Environmental Hydrogeology</td>
</tr>
<tr>
<td>GEOL 4381  Geophysical Signals and Analysis</td>
<td>GEOL 3377  Oceanography</td>
</tr>
<tr>
<td>GEOL 4370  Global Seismology</td>
<td>GEOL 3383  Remote Sensing</td>
</tr>
<tr>
<td>CHEM 1331  Fundamentals of Chemistry</td>
<td>GEOL 4331  Geospatial Analysis and Applications</td>
</tr>
<tr>
<td>CHEM 1111  Fundamentals of Chemistry Lab I</td>
<td>GEOL 4365  Environmental Geochemistry</td>
</tr>
<tr>
<td>CHEM 1332  Fundamentals of Chemistry II</td>
<td>GEOL 4382  Introduction to Petroleum Geology</td>
</tr>
<tr>
<td>CHEM 1112  Fundamentals of Chemistry Lab II</td>
<td>GEOL 4397  Selected Topics-Geology</td>
</tr>
<tr>
<td>MATH 1431  Calculus I</td>
<td>Capstone Requirement:</td>
</tr>
<tr>
<td>MATH 1432  Calculus II</td>
<td>All students in the College of Natural Sciences and Mathematics must complete</td>
</tr>
<tr>
<td>MATH 2433  Calculus III</td>
<td>the Capstone requirement. Geophysics majors may satisfy the capstone by</td>
</tr>
<tr>
<td>MATH 3321  Engineering Mathematics</td>
<td>completing:</td>
</tr>
<tr>
<td>MATH 3363  Introduction to Partial Differential Equations</td>
<td>GEOL 4355  Geophysical Field Camp</td>
</tr>
<tr>
<td>MATH 3364  Introduction to Complex Analysis</td>
<td>GEOL 4381  Geophysical Signals and Analysis</td>
</tr>
<tr>
<td>PHYS 1321  University Physics I</td>
<td></td>
</tr>
<tr>
<td>PHYS 1121  Physics Laboratory I</td>
<td></td>
</tr>
<tr>
<td>PHYS 1322  University Physics II</td>
<td></td>
</tr>
<tr>
<td>PHYS 1122  Physics Laboratory II</td>
<td></td>
</tr>
<tr>
<td>ONE of the following:</td>
<td></td>
</tr>
<tr>
<td>GEOL 3370  Mineralogy</td>
<td></td>
</tr>
<tr>
<td>GEOL 3372  Petrograph</td>
<td></td>
</tr>
</tbody>
</table>
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
- 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
COLLEGE OF TECHNOLOGY

- 55 Biotechnology, BS
- 56 Computer Engineering Technology, BS
- 57 Construction Management, BS
- 58 Electrical Power Engineering Technology, BS
- 59 Mechanical Engineering Technology, BS
- 60 Organizational Leadership & Supervision, BS
- 61 Supply Chain & Logistics Technology, BS
The College of Technology 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.
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

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

BTEC 4101  Principles of Bioprocessing Lab
BTEC 4319  Microbial Biotechnology
3 credit hours approved electives

ELECTIVE COURSES
6 credit hours free elective
3 credit hours approved electives
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
ELET 1400  Circuit Theory and Lab I
ELET 1401  Circuit Theory and Lab II
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 3402  Communications Circuits
ELET 3403  Sensor Applications
ELET 3405  Microprocessor Architecture
ELET 3425  Embedded Systems
ELET 4308  Senior Project
ELET 4208  Senior Project Lab
ELET 4421  Computer Networks
CHEM 1301  Foundations of Chemistry
MATH 1431  Calculus I
MATH 1432  Calculus II
MATH 3321  Engineering Mathematics OR
MATH 3307  Statistical Applications
MECT 3341  Computer-Aided Drafting I
MECT 4188  Ethics in Engineering Technology
TECH 3366  Applied Numerical Methods
TLIM 3363  Technical Communications
PHYS 1301  Introductory General Physics I
PHYS 1101  General Physics I Lab
PHYS 1302  Introductory General Physics II
PHYS 1102  General Physics II Lab

ONE of each of the following:
HDCS 3300  Organizational Decisions in Technology
TLIM 3340  Organizational Leadership and Supervision

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
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
- 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

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

6 credit hours free elective
6 credit hours of approved ELET advanced electives, selected from the following:
ELET 4302 Data Communications Systems
ELET 4304 Control Systems
ELET 4310 Alternative Electrical Energy Sources
3 credit hours approved ELET elective
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 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
HDCS 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.
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 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 for elective course listings
IN ENERGY
66 Architecture
67 Industrial Design

Additional degree(s) offered:
Architecture, MA
Architecture, MArch
The Master of Science in Architecture is a post-professional degree focused on deep research through experimental design inquiry. This program is dedicated to cutting edge research and experimentation, and seeks to explore in a highly innovative fashion the cultural and technological landscapes of Houston. With a highly flexible curriculum, the degree allows for maximum individuation within both the graduate topic studios and an open selection of elective courses. The degree provides for an intensive yearlong (two semester) degree track with highly individuated curation of content allowing for a deep and focused inquiry. Culminating in an individual yearlong Master Degree Project, the post-professional students have an opportunity to examine diverse issues confronting contemporary practice through critical design inquiry.

The MS in Architecture program is an immersive experience, graduating critical thinkers capable of facilitating holistic and performative design decisions. Our goal is to create strategic thinkers who lead design.

The post-professional Master of Science in Architecture degree is a design-based program centered on the studio for students already possessing a professional degree in architecture, urban planning, urban design, landscape architecture, or related design fields. It integrates the complexities of design thinking through advanced and deep inquiry in a highly individuated curriculum. The two semester program consists of 36 academic credits in consecutive Fall and Spring sessions.

**SAMPLE DEGREE PLAN**

**Course of Study:** Students must have a minimum of 36 credit hours of approved study that include the following:

- 15 credit hours in advanced, prescribed courses as described below.
- 21 credit hours of elective study approved by the Director of Graduate Studies. Students must obtain approval of their degree plans, including electives, before the conclusion of the first semester of enrollment.

Some prerequisites may be required. Entering students must obtain approval of their degree plans before the ends of the first semester.

**Fall**
- ARCH 6393  Research/Master's Project Preparation
- ARCH 7600  Architecture Design Studio V
- ARCH X3XX  Elective/Independent Research
- ARCH X3XX  Elective/Independent Research
- ARCH X3XX  Elective/Independent Research

**Spring**
- ARCH 7600  Architecture Design Studio V
- ARCH X3XX  Elective/Independent Research
- ARCH X3XX  Elective/Independent Research
- ARCH X3XX  Elective/Independent Research

** Additional available graduate programs:** Master of Architecture (MArch +2), Master of Architecture (MArch +3), and Master of Arts in Architectural Studies.
The Master of Science degree in Industrial Design is a two-year curriculum committed to design innovation, research, and commercialization. Forged by connections to the medical, energy, aerospace, and entertainment industries in local, regional, national, and international contexts, our graduate program advocates for a new form of design knowledge that merges theory and practice and provides a new perspective on creativity, product and system development, services, and environment with an emphasis on interdisciplinary studies.

Each graduate student develops his/her personalized curriculum in consultation with the Director of the Industrial Design program based on the student’s needs, interests, background, and specific area of study. An interdisciplinary study plan of 36 credit hours (15 required, 9 ID electives, and 12 general electives) needs to be completed for graduation. Elective courses may be taken in other departments and colleges at the University of Houston as needed.

Candidates without an undergraduate degree in Industrial Design are advised to complete an additional 17 credits to develop fundamental design thinking and visualization skills. The Director of the Industrial Design program and the faculty will advise and approve appropriate courses toward the completion of these 17 credits.

**SAMPLE DEGREE PLAN**

*With Certificate of Entrepreneurship*

**First Year:**
- IND5 6350 Design Studies
- IND5 6355 Integrated Design Research
- IND5 6360 Industrial Design Studio
- IND5 6340 Advanced Design Materials
- IND5 6345 Advanced Human Factors
- ENTR 7336 Entrepreneurship Overview
- ENTR 7337 Entrepreneurship Capital and Legal Forms

**Second Year:**
- IND5 7300 Design Thesis I
- IND5 7301 Design Thesis II
- IND5 6397 Selected Topics
- Two of the following:
  - ENTR 7381/ ENTR 7383 Technical Commercialization Projects
  - FINA 7326 Private Equity and Investment Banking

*ID electives: Advanced Design Materials, Advanced Human Factors, 3D Visualization, Seminar, Special Topics.

**SAMPLE DEGREE PLAN**

*Design Research and Development*

**First Year:**
- IND5 6350 Design Studies
- IND5 6355 Integrated Design Research
- IND5 6360 Industrial Design Studio
- IND5 6340 Advanced Design Materials
- IND5 6345 Advanced Human Factors
- ENTR 7336 Entrepreneurship Overview *
- ENTR 7337 Entrepreneurship Capital and Legal Forms *

**Second Year:**
- IND5 7500 Design Thesis I
- IND5 7301 Design Thesis II
- IND5 6397 Selected Topics
71 Accounting, MSAccy
72 Economics of the Energy Value Chain, Certificate
73 Energy Finance, Certificate
74 Energy Investment Analysis, Certificate
75 Energy Risk Management, Certificate
76 Global Energy Management, MS
77 Oil & Gas Accounting, Certificate
78 Supply Chain Management, MS
79 Supply Chain Management Program (DISC), Certificate
The MSACCY program is designed to be flexible and is anticipated to be completed in one year for full-time students. The curriculum requirements are based on 36 graduate hours including 24 hours of graduate accounting or IT courses. Students can develop a skilled specialization in one of our five certificate tracks: Assurance/Financial Reporting, Advanced Internal Audit, Taxation, Oil & Gas and IT Systems Risk Management. The program provides an opportunity to acquire a strong graduate foundation in accounting and also pursue an area of particular student interest or career aspiration.

The program offers a flexible class schedule and courses that provide students with the right balance of technical knowledge and critical thinking capabilities sought by today's employers. The majority of our MSACCY courses (approximately 80%) are offered in the evening to accommodate working professionals. The remaining courses are offered during the regular day class schedule. Students learn to solve complex business problems, recognize dysfunctional accounting situations, and respond appropriately to ethical and regulatory dilemmas; while engaging in accounting research and gaining first-hand experience communicating their findings. Emphasis is placed on the strong background needed to successfully complete the Texas Uniform CPA exam.

**SAMPLE DEGREE PLAN**

**9 credit hours basic courses that must be completed prior to admission:**

- College-level calculus courses (MATH 1314: Elements of Calculus with Applications)
- ACCT 2331: Financial Accounting (Principles of Accounting I)
- ACCT 2332: Managerial Accounting (Principles of Accounting II)

The basic prerequisite courses may be taken at a community college, at UH through the Certificate in Accountancy Program (CAP), or at any accredited college or university.

**18 credit hours of Accounting Foundation courses:**

- ACCT 5367: Intermediate I
- ACCT 5368: Intermediate II
- ACCT 5331: Federal Income Tax I: Individual
- ACCT 5335: Financial Statement Auditing
- ACCT 5337: Management (Cost) Accounting
- ACCT 5371: Accounting Information Systems

**12 credit hours of Business Foundation courses:**

- BZAN 6310: Quantitative Analysis for Business Decisions
- FINA 6387: Managerial Analysis
- MARK 6A61: Marketing Administration
- MANA 6A32: Organizational Behavior and Management
- 3 credit hours Business Elective

**Degree Requirements: Major-Specific Courses**

- ACCT 7330: Advanced Accounting
- ACCT 7375: Corporate Taxation
- GENB 7304: Business Ethics for Accountants
- GENB 7305: Commercial Law
- GENB 7303: Professional Accounting Communication

**Applied Data Analytics in Accounting**

- ACCT 7373: Applied Data Analytics in Accounting I
- ACCT 7373: Applied Data Analytics in Accounting II
- BZAN 7320: Business Modeling for Competitive Advantage

**One of the following:**

- ACCT 7370: Advanced Financial Statement Auditing
- ACCT 7362: Tax Research
- ACCT 7397: Current Issues in Taxation

**Oil & Gas**

- ACCT 7337: Oil & Gas Taxation
- ACCT 7386: Oil & Gas Accounting I
- ACCT 7387: Oil & Gas Accounting II
- ACCT 7388: Oil & Gas Accounting III

**IT Systems Risk Management Track**

- ACCT 7382: Governance, Risk and Compliance
- ACCT 7385: Fraud Examination
- MIS 7373: Business Applications of Data Base Management Systems I
- MIS 7376: Systems Analysis and Design
- MIS 7378: Information Technology Management and Control
- MIS 7381: Management of Information Security
ECONOMICS OF THE ENERGY VALUE CHAIN CERTIFICATE

Students interested in developing a broad economic perspective on the energy business should consider this certificate. The courses offered should be very helpful to engineers and other functional specialists seeking to develop managerial perspective suitable for executive responsibilities.

The certificate exposes students to both the ‘physical’ side of the energy business: what is the nature of the assets, operations and products produced, and to the economics of each component of the EVC. Students will be able to gain an understanding of how the energy firms’ activities ‘add value’ along the chain. For example, how basic refinery units upgrade crude oil and how more complex conversion and chemical units upgrade basic products into higher value fuels or chemicals. The role of transportation logistics and trading will also be considered.

CERTIFICATE PLAN

Prerequisites: Elective certificates are only offered to actively-enrolled MBA and MS students. The only exception applies to MBA and MS alumni, who may also return to pursue certificates.

To obtain this certificate, students must complete 9 credit hours, selected from the following:

- FINA 7371 Energy Value Chain
- FINA 7372 Upstream Economics
- FINA 7373 Petrochemical & Refining Economics
- FINA 7397 Energy Value Creation
- FINA 7397 Future of Value Creation in the O & G Industry
- FINA 7397 Midstream Energy Finance
- FINA 7397 Electric Power Markets
- GENB 7397 Capturing Upstream Growth Opportunities
Students who wish to become expert in the financial management of energy firms should consider this certificate. The courses offered should benefit professionals in the Treasury and Controllers functions and those aspiring to a CFO position for an energy firm.

Energy Finance exposes students to the connection between the business strategy and financing strategy of the energy firm. EF explores the two principal strategies for financing energy companies, i.e., Centralized and Stand-alone financing, and devotes considerable attention to the interplay between financing and the special tax optimization opportunities available to energy firms. Oil and Gas accounting, the measurement and management of foreign exchange/remittance risks, the strategic uses of project finance, and the operation of an internal affiliate financing system are major topics covered.

**CERTIFICATE PLAN**

**Prerequisites:** Elective certificates are only offered to actively-enrolled MBA and MS students. The only exception applies to MBA and MS alumni, who may also return to pursue certificates.

**To obtain this certificate, students must complete 9 credit hours, selected from the following:**

- FINA 7A97 Fixed Income Security Analysis
- FINA 7A30 Advanced Corporate Finance
- FINA 7A33 Mergers & Acquisitions
- FINA 7A97 Strategy for Project Finance
- FINA 7A97 Techniques for Project Finance
- FINA 7352 Energy Derivatives
- FINA 7360 International Finance
- FINA 7397 Energy Value Creation
- FINA 7397 Energy Insurance and Risk Management
- FINA 7397 Future of Value Creation in the O & G Industry
- ACCT 7397 Oil and Gas Accounting
ENERGY INVESTMENT ANALYSIS

Students interested in developing superior insight into the economics of energy industry capital projects should consider this certificate. Students currently working in or interested in working in project development, strategic planning, mergers and acquisitions, capital budgeting, business unit management or energy security analysis should find this certificate helpful to career development.

All courses assume a basic familiarity with the standard NPV/IRR methodology. EIA focuses on special analytical challenges characteristic of the energy industry. These include the tendency for energy projects to contain various embedded options, the capacity of many projects to support substantial amounts of project debt, the fact that energy projects typically are conceived within broader competitive strategies and the reality that many such projects are exposed to varied, severe political risks. EIA will expose students to specific analytical frameworks and strategies that address these challenges, such as: Real options, Competitive Strategy, Project Finance with Leveraged Economics, and market-based techniques to measure and adjust for political risk.

CERTIFICATE PLAN

Prerequisites: Elective certificates are only offered
to actively-enrolled MBA and MS students. The only exception applies to MBA and MS alumni, who may also return to pursue certificates.

To obtain this certificate, students must complete 9 credit hours, selected from the following:

FINA 7A97  Fixed Income Security Analysis
FINA 7A30  Advanced Corporate Finance
FINA 7A33  Mergers & Acquisitions
FINA 7A97  Strategy for Project Finance
FINA 7A97  Techniques for Project Finance
FINA 7360  International Finance
FINA 7376  Energy Trading
FINA 7397  Energy Analysis
FINA 7397  Financial Risk Management
FINA 7397  Future of Value Creation in the O & G Industry
FINA 7397  Midstream Energy Finance
FINA 7397  Energy Value Creation
FINA 7397  Electric Power Markets
ACCT 7397  Oil and Gas Accounting
BZAN 7320  Business Modeling for Competitive Advantage
Students who wish to become expert in the financial management of energy firms should consider this Certificate. The courses offered should benefit professionals in the Treasury and Controllers functions and those aspiring to a CFO position for an energy firm.

Energy Finance exposes students to the connection between the business strategy and financing strategy of the energy firm. EF explores the two principal strategies for financing energy companies, i.e., Centralized and Stand-alone financing, and devotes considerable attention to the interplay between financing and the special tax optimization opportunities available to energy firms. Oil and Gas accounting, the measurement and management of foreign exchange/remittance risks, the strategic uses of project finance, and the operation of an internal affiliate financing system are major topics covered.

**CERTIFICATE PLAN**

**Prerequisites:** Elective certificates are only offered to actively-enrolled MBA and MS students. The only exception applies to MBA and MS alumni, who may also return to pursue certificates.

**To obtain this certificate, students must complete 12 credit hours, selected from the following:**

- FINA 7352 Energy Derivatives (REQUIRED)
- FINA 7A10 Intermediate Corporate Finance: Valuation
- FINA 7A97 Fixed Income Security Analysis
- FINA 7A33 Mergers, Acquisitions and Joint Ventures
- FINA 7371 The Energy Value Chain
- FINA 7350 Derivatives I: Options
- FINA 7351 Derivatives II: Forwards, Futures and Swaps
- FINA 7376 Energy Trading
- FINA 7397 Financial Engineering
- FINA 7397 Energy Analysis
- FINA 7397 Financial Risk Management
- FINA 7397 Energy Insurance and Risk Management
- FINA 7397 Future of Value Creation in the O & G Industry
- FINA 7397 Energy Value Creation
- MIS 7397 Energy Trading Systems
GLOBAL ENERGY MANAGEMENT  MS

Energy is the largest industry in the world and commands a diverse spectrum of operations. Energy companies need leaders whose primary expertise lies in a great many fields of study, but the common denominator is always business. Engineer or Geologist - whether you’re running a power plant or searching for that next big well, energy companies are businesses and tomorrow’s energy leaders have to understand how they work.

For today’s undergrad the energy industry is one of the fastest growing career sectors, and The Bauer College of Business Global Energy Management (GEM) program is the ultimate start. Energy isn’t all hardhats and smokestacks. Powering the planet takes business leadership - and that’s where you come in. It’s the perfect environment for aspiring business people of all kinds, offering lucrative jobs, exotic travel, exciting challenges and a chance to be a part of something big.

Few realize how fundamental energy is to our standard of living, but in reality it is the life blood of our global economy. This exciting job market attracts the best and brightest from around the globe and your timing is perfect. A flood of today’s energy executives will soon retire. Energy corporations are clamoring for capable young business leaders.

DEGREE PLAN: 36 semester hours

7.5 credit hours foundation courses:

ACCT 6331  Financial Accounting  
BZAN 6310  Quantitative Analysis for Business Decisions  
FINA 6A35  Managerial Finance

22.5 credit hours prescribed electives:

ACCT 7386  Oil & Gas Accounting I  
FINA 7371  Energy Value Chain  
FINA 7372  Upstream Economics  
FINA 7373  Petrochemical and Refining Economics  
MANA 7394  Management of Human Resources in the O&G Industry  
MARK 7373  Business to Business Marketing  
SCM 7A97  Energy Supply Chain Management

6 credit hours electives, selected from the following:

FINA 7334  Strategy for Project Finance  
FINA 7336  Techniques for Project Finance  
FINA 7376  Energy Trading  
FINA 7397  Energy Analysis  
FINA 7397  Value Creation in the Oil & Gas Industry  
FINA 7397  Alternative Energy Investments  
FINA 7397  Midstream Energy Finance  
GENB 7397  Capturing Upstream Growth Opportunities  
MIS 7397  Energy Trading Systems  
FINA 7352  Energy Derivatives
The Oil & Gas (O&G) Certificate delivers the tools and cross-functional expertise to prepare students for positions in the oil and gas industry. A three-course certificate in Oil and Gas/Energy was developed through a joint effort with upstream, midstream, downstream, other energy companies in the industry, 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 and 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 and Energy industries. Many of these companies will offer internships designed to prepare students for a career in O&G and 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.

**SAMPLE CERTIFICATE PLAN**

**Requirements for obtaining the O&G Certificate:**

- Complete three (3) required course and one (1) colloquium listed specifically for the certificate. Courses cannot be substituted for the required list.
- Earn a passing letter grade for each certificate course.
- Have a minimum cumulative GPA of 3.0 for the 3 certificate courses.
- A minimum cumulative and accounting GPA of 2.5.
- Earn a letter grade of “S” (satisfactory) for the required colloquium.

**O&G Certificate Courses:**

- ACCT 7386  Oil & Gas Accounting I
- ACCT 7387  Oil & Gas Accounting II
- ACCT 7388  Oil & Gas Accounting III
- ACCT 7337  O&G Taxation

**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.
SUPPLY CHAIN MANAGEMENT MS

The Master of Science in Supply Chain Management Program addresses the creation and delivery of products from suppliers to the final customer. Supply chain management is a rapidly growing business discipline being driven by advanced applications of information technology and the important role of supply chain management in an increasingly global economy. With global operations becoming more complex, companies in manufacturing, retail and technology, along with the consulting firms that service them, find themselves in need of people with supply chain expertise. The program is a structured program designed to accommodate both full-time and part-time students with required courses in business fundamentals, the supply chain core (e.g., demand and supply integration, logistics management, sourcing and procurement, contracting and negotiation) and supply chain analytics (supply chain analysis and design, supply chain optimization, and quality and productivity management).

The Bauer College of Business has assembled a nationally renowned faculty in supply chain management to help provide business professionals with an opportunity to advance their careers by enhancing their professional knowledge and obtaining an advanced professional credential in the field of SCM. The program provides a focused course of study that will increase the understanding of the theory and practice of supply chain management.

DEGREE PLAN: 30 credit hours

12 credit hours supply chain management analytics

SCM 7320  Supply Chain Analytics
SCM 7380  Enterprise Operations and Business Intelligence
BZAN 6351  Basic Programming for Business Analytics
BAZN 6357  Business Analytics - Frameworks and Methods

18 credit hours supply chain management core

SCM 6A01  Supply Chain Management Concepts
SCM 7A01  Project Management
SCM 7325  Process Analysis and Design
SCM 7330  Demand and Supply Integration
SCM 7335  Logistics Management
SCM 7350  Strategic Supply Management
SCM 7385  Supply Chain Corporate Projects
The primary focus of this certificate is to provide students with in-depth knowledge regarding the complexity and challenges of managing Global Supply Chains. Every function of global commerce - marketing, procurement, manufacturing operations, logistics, inventory management, information technology, and customer relations - are impacted by supply chain professionals. Students will gain exposure to all of the supply chain elements individually, and understand their associated interactions as well as the interactions with the other business functions. They will comprehend the need for balance and for managing trade-offs in the supply chain. They will be better able to identify the key drivers and the associated managerial levers that impact supply chain performance.

The certificate will be of interest to anyone who currently has or seeks a primary or secondary role in supply chain management. This includes those involved in procurement (sourcing/purchasing), operations, logistics, engineering, project and product management, as well as entrepreneurs, consultants, and general managers.

**CERTIFICATE PLAN**

**Prerequisites:** Elective certificates are only offered to actively-enrolled MBA and MS students. The only exception applies to MBA and MS alumni, who may also return to pursue certificates.

**To obtain this certificate, students must complete 12 credit hours, selected from the following:**

- SCM 7330 Demand Supply Integration
- SCM 7350 Strategic Supply Management
- SCM 7390 Global Supply Chain Strategy
- BZAN 7320 Business Modeling for Competitive Advantage
- SCM 7397 Process Analysis and Design
- SCM 7397 Logistics Management
- SCM 7397 Corporate Projects
CULLEN
COLLEGE OF ENGINEERING

79 Aerospace Engineering, MS
80 Chemical Engineering, MChE | PhD
81 Civil Engineering, MSCE | PhD
82 Computer & Systems Engineering, MS
83 Electrical Engineering, MS | MEE | PhD
84 Industrial Engineering, MSIE | MIE | PhD
85 Materials Science & Engineering, MS | PhD
86 Mechanical Engineering, MS | PhD
87 Petroleum Engineering, MS | MPE | PhD
88 Space Architecture, MS
89 Subsea Engineering, MS
AEROSPACE ENGINEERING

The Houston area is recognized nationally for the strength of its aerospace-oriented companies and its proximity to the NASA Johnson Space Center. The Aerospace Program offers the opportunity for graduate study to those employed or seeking employment in the aerospace field to help them advance in the technical track of this profession.

Unrestricted admission to this program requires an accredited undergraduate degree in Aerospace or Mechanical Engineering. Those applicants with undergraduate degrees in other fields of engineering and science or mathematics are eligible for admission, but might be required to complete several leveling courses to prepare themselves for successful participation in the program. Application for entry into the program should follow the same application procedure listed under the graduate Mechanical Engineering program and the applicants should complete the corresponding application forms stating “Aerospace Engineering” as their major.

Graduate students interested in the related fields of Aerospace Engineering and Space Architecture can combine their studies in a Dual Aerospace Engineering/Space Architecture Master of Science degree program. The dual degree allows students to obtain a MS degree in Aerospace Engineering and a MS degree in Space Architecture by completing 46 credit hours of relevant graduate coursework. With the selection of graduate courses within the Aerospace Engineering and the Space Architecture programs students can be awarded both degrees. Hence, the dual degree plan significantly reduces the total number of credit hours needed if the two degrees were pursued separately.

SAMPLE MASTER'S DEGREE PLAN

<table>
<thead>
<tr>
<th>HOURS</th>
<th>CORE*</th>
<th>DESIGNATED ELECTIVES</th>
<th>THESIS OR DISSERTATION RESEARCH</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.S. (nonthesis)</td>
<td>18</td>
<td>12</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>M.S. (thesis)</td>
<td>18</td>
<td>3</td>
<td>9/0</td>
<td>30</td>
</tr>
</tbody>
</table>

Core Area A: Aerodynamics and Heat Transfer
- MECE 5312 Computational Fluid Dynamics I
- MECE 5361 Introduction to Compressible Flow
- MECE 5363 Fluid Mechanics
- MECE 6333 Conduction and Radiation
- MECE 6334 Convection Heat Transfer
- MECE 6353 Intro Comp Fluid Dynamics

Core Area B: Structural Mechanics and Materials
- MECE 5307 Fracture of Structural Materials
- MECE 5332 Introduction to Continuum Mechanics
- MECE 5371 Vibration Analysis
- MECE 6320 Composite Materials
- MECE 6321 Polymer Materials & Mechanics
- MECE 6322 Polymer Viscoelstcty & Failure
- MECE 6361 Mechanical Behavior/Materials
- MECE 6365 Semiconductor Materials & Photonic & Electrical Devices
- MECE 6377 Continuum Mechs I
- MECE 6382 Theory of Elasticity
- MECE 6387 Intelligent Structural Systems

Core Area C: Controls and Dynamics
- MECE 6367 Control Systems Analysis & Design
- MECE 6388 Optimal Control Theory
- MECE 6389 Matrix Inequality Control
- ECE 6325 State-Space Control Systems
- ECE 6335 Digital Control Systems
- ECE 6390 Lin Multivar Control Systems
- PHYS 6309 Advanced Mechanics I
- PHYS 7308 Space & Atmospheric Physics
- PHYS 8307 Advanced Space Physics
A Master of Chemical Engineering (MChE) degree is offered as a non-thesis program for the working professional. The program has been designed for those persons who plan careers in plant operations, design and management. It is not intended to be competitive with the Master of Science degree, which is specifically research oriented, nor with the MBA degree. Rather, the goal of this program is not only to permit earlier productive use of the young engineer’s technical skills, but also to introduce the engineer to the broad concepts of systems, analysis, advanced process economics, and technical management. The program is aimed at improving opportunities for chemical engineers in the chemical process industry and related industries.

Constituting the program is a core of five (5) required courses plus five elective courses, selected to meet the student’s interests in the areas of process control, management and business economics, biochemical and environmental engineering, and petroleum engineering. The courses are available in the late afternoon and evenings, and the degree can be completed in 2-3 years of part-time study.

Professionals working in the chemical process industry and related industries with degrees other than but related to chemical engineering (such as mechanical engineering or chemistry) are encouraged to apply. If admitted to the MChE program, such students are required to take a number of undergraduate chemical engineering courses that will prepare them to take the graduate-level MChE courses. A list of preparatory courses is composed by the MChE Director on an individual basis, depending on the student’s background.

**SAMPLE MASTER’S DEGREE PLANS**

**MChE Plan (30 credit hours):**
15 credit hours of required courses:
- CHEE 6368 Chemical Process Economics I
- CHEE 6369 Chemical Process Economics II
- CHEE 6383 Advanced Unit Operations
- CHEE 6367 Advanced Process Control*
- INDE 6372 Advanced Linear Optimization
* Offered every two years

15 credit hours of approved electives

**MSChE Plan (30 credit hours):**
12 credit hours of required courses:
- CHEE 6330 Foundations of Mathematical Methods in Chemical Engineering
- CHEE 6333 Transport Processes
- CHEE 6335 Classical Statist Thermo
- CHEE 6337 Advanced Reactor Engineering
18 credit hours of approved electives

**Elective Courses:**
- CHEE 6330 Foundations of Mathematical Methods in Chemical Engineering
- CHEE 6331 Mathematical Methods In Chemical Engineering I
- CHEE 6332 Mathematical Methods In Chemical Engineering II
- CHEE 6333 Transport Processes I
- CHEE 6335 Classical and Statistical Thermodynamics
- CHEE 6337 Advanced Reactor Engineering
- CHEE 6360 Biochemical Engineering Fundamentals
- CHEE 6370 Advanced Topics in Biochemical Engineering
- CHEE 6371 Pollution Control Engineering
- CHEE 6375 Chemical Processing for Microelectronics
- CHEE 6379 Safety and Reliability
- CHEE 6386 Air-Pollution Problems and Control
- CHEE 6390 Energy and the Environment
- CHEE 6397 Prob. and Stat. for Chemical and Petroleum Engineers
- CHEE 6397 Introduction to Polymer Science
- INDE 6332 Engineering Project Management
- INDE 6335 Engineering Administration
- INDE 6350 Statistical Process Control
- INDE 6364 Experimental Design and Regression
- INDE 6370 Operation Research - Digital Simulation
- INDE 6371 Operations Research, Optimization Methods
- PETR 6351 Introduction to Petroleum Engineering
  (Prereq: Graduate Standing)
- PETR 6362 Reservoir Engineering I
  (Prereq: PETR 6351, Graduate Standing)

*Additional elective courses and PhD requirements can be found on chee.uh.edu*
The Master of Science in Civil Engineering (MSCE) program has both thesis and non-thesis options. The thesis option requires a minimum of 21 credit hours in addition to the thesis, which is written and defended in front of a faculty committee. The non-thesis option requires a minimum of 31 credit hours.

Close to the end of the first semester, the student in consultation with the Director of Graduate Studies, shall choose an Advisor. The advisor shall counsel the student for the remainder of his/her study program and supervise the thesis. By agreement of all concerned, the initial relationship may be dissolved and a new one established, but the student must have an Advisor at all times after the first semester.

Prior to completion of the first semester, the student and the advisor will submit to the Director of Graduate Studies the student’s Preliminary Degree Plan. The degree plan will list the specific courses, which must be completed to obtain the MSCE degree. Changes in this plan, if required, will be approved in writing by the advisor and the Director of Graduate Studies. Only those studies undertaken in accordance with this approved degree plan shall be credited towards the MSCE degree.

**SAMPLE MASTER’S DEGREE PLAN**

Non-thesis students are required to take 31 hours of organized courses, 10 courses plus a 1 credit hour seminar. The information presented in all but items 3 and 6 below apply to the non-thesis degree.

The thesis program requires 21 semester credit hours of courses plus a thesis as follows:

- 15 to 21 hours of Civil Engineering courses at the 5000 level or above. No more than 3 credit hours may be 5000 level, and must include a sequence of at least 12 credit hours in the student’s major area of interest of 6000 level courses or above.
- At most, 6 credit hours of courses in approved related fields outside Civil Engineering may be counted toward the degree.
- 9 credit hours of thesis (CIVE 6398, 6399, 7399). Registration in CIVE 6398 and 6399 in one semester is followed by registration in CIVE 7399 in subsequent semesters and is repeated continuously until the thesis is completed. Other research courses (CIVE 6198 through 6598) may be required. Registration in thesis should be continuous and uninterrupted.
- The courses must be in accordance with a degree plan approved by the student's Advisor and the Director of Graduate Studies.
- No more than 6 hours of graduate credit may be transferred from another institution. Also, a maximum of 6 hours of P.B. credit may be changed to graduate credit. Transferred and P.B. courses must have a grade of B or better.
- The student is required to take CIVE 6111 (Graduate Seminar) during his/her registration in the thesis or research courses. This is in addition to the 21 hours of courses and 9 hours of thesis and research course requirements described above. Full-time, supported students must register in CIVE 6111 every semester unless permission is granted by the department chairman and the advisor for an exception.
- A final GPA of at least 3.0/4.0 over all courses attempted is required for graduation.
- No course in which a grade less than C is received will count within the degree program. A grade of C+ or less in 4 courses attempted during the program will result in final dismissal of the student from graduate study.
- Technology courses will not be counted within the degree program.
- A course cannot be attempted more than three times; a grade of “W” is considered an attempt.

*Additional elective courses and PhD requirements can be found on cive.uh.edu*
Computer and systems engineering is an interdisciplinary program that provides specialization in computer engineering. Graduates of the computer and systems engineering program will be prepared to design state-of-the-art hardware and software systems that include computing, communications and networking, control functions, sensing, signal processing and much more.

Computer and systems engineering graduate students at the University of Houston have the opportunity to work with and learn from faculty recognized as world leaders in their fields. These include Fellows of the IEEE and the National Academy of Inventors, multiple winners of the National Science Foundation (NSF) CAREER Awards, and investigators in major research projects supported by NASA, the Defense Advanced Research Projects Agency, the National Institutes of Health, the Advanced Research Projects Agency - Energy and the NSF.

Applicants can have a B.S. in any one of the following fields: Electrical Engineering, Computer Engineering, Computer Science or a degree in any engineering field or Quantitative Science. Depending on previous background, a set of prerequisites might have to be satisfied before the student starts the graduate program in CSE. A student can complete the degree on a full or part time basis and has the option of doing a thesis or not. A full description of the CSE Program Requirements can be found on ece.uh.edu.

**SAMPLE MASTER’S DEGREE PLAN**

**Thesis Option:**
A student who follows the thesis option should complete a minimum of 30 semester hours.
- A minimum of 18 semester credit hours of coursework (6 courses)
- 4 of these courses should be from the List of Required ECE Courses
- 6 hours of thesis (ECE 6399 and ECE 7399) and
- 6 hours of research (ECE 6398)

**Non-Thesis Option:**
A student who follows the non-thesis option should complete a minimum of 30 semester hours.
- A minimum of 30 semester credit hours of coursework (10 courses)
- 4 of these courses should be from the List of Required ECE Courses
- A minimum of 6 ECE courses
- A maximum of 4 courses from the Department of Computer Science, College of Engineering, or College of Business Administration. No courses from the College of Technology can be used on the degree plan.

Before graduation the student’s degree plan will have to be approved by the thesis advisor, the ECE Academic Advisor, and the Director of the Computer and Systems Engineering Program.

**Required Courses:**
Choose 4 courses from the following required course list:
- ECE 6370  Advanced Digital Design
- ECE 6346  VLSI Design
- ECE 6373  Advanced Computer Architecture
- ECE 7373  Advanced Topics in Computer Architecture
- ECE 6321  Principles of Internetworking
- ECE 6372  Advanced Hardware Design
- ECE 6328  CMOS Analog Integrate Circuits

To satisfy the coursework requirements and form a meaningful coherent program of study, a student may choose the remaining courses from the following list of Suggested ECE elective courses.

**Elective Courses:**
- ECE 5367  Computer Architecture and Design
- ECE 6313  Neural Networks
- ECE 6315  Neural Computation
- ECE 6316  Computational and Biological Vision
- ECE 6321  Principles of Internetworking
- ECE 6322  Introduction to Spread Spectrum Communications
- ECE 6323  Optical Fiber Communications
- ECE 6324  Digital Telephony
- ECE 6328  CMOS Analog ICs
- ECE 6325  State Space Control Systems
- ECE 6330  Mobile Radio Communication Systems
- ECE 6331  Advanced Telecommunications Engineering
- ECE 6332  Wireless Telecommunication Systems

*Additional elective courses and PhD requirements can be found on ece.uh.edu*
Electrical engineering is an exciting and continually developing field – it encompasses virtually anything you can think of that requires electrical power to operate. As an electrical engineering graduate student at UH, you will become experienced with electrical engineering design, systems operation, manufacturing and management. Students may specialize in one of four areas of strength, including: control and power systems, electromagnetics and microelectronics, electronics and computers, and signals and communications. Graduate students with an interest in power systems can pursue a specialized industrial power systems track within the program, offering specialized training on industrial power systems design, power systems analysis, regulations and standards, equipment and systems protection. The industrial power systems track was established at the request of industry and its curriculum was shaped with the guidance of leaders in the power systems industry to ensure students develop the knowledge and skills required for current workforce needs.

Electrical engineering graduate students at the University of Houston have the opportunity to work with and learn from faculty recognized as world leaders in their fields. These include Fellows of the IEEE and the National Academy of Inventors, multiple winners of the National Science Foundation (NSF) CAREER Awards and investigators in major research projects supported by NASA, the Defense Advanced Research Projects Agency, the National Institutes of Health, the Advanced Research Projects Agency - Energy and the NSF.

The UH Cullen College of Engineering offers a Master of Science in Electrical Engineering (MSEE) degree and a Ph.D. degree in electrical engineering, as well as a graduate-level certificate in “Power Systems and Smart Grid” or “Power Electronics and Renewable Energy Technologies”. Students have the option of taking some MSEE courses online.

**SAMPLE MASTER’S DEGREE PLANS**

**Master of Science in Electrical Engineering (MSEE, with thesis):**

The Master of Science (MSEE) degree is a research-oriented degree and requires the completion of a thesis that describes the results of research conducted under the guidance of a faculty advisor. This is a good option for students who haven’t yet decided if they want to pursue an R&D career and/or aren’t set on their exact area of study. As such, it is very important that students select an advisor as soon as possible, ideally prior to beginning the program.

Course Requirements:
- A minimum of 30 semester credit hours of graduate studies (18 hours of coursework + 12 hours of thesis and research)
- A minimum of 15 hours of ECE courses (6000 level or higher) with 6 of those hours in the concentration area
- 6 hours of thesis (ECE 6399 & ECE 7399)
- 6 hours of research (ECE 6X98)

**Master of Science in Electrical Engineering (MSEE, Non-thesis option):**

The Master of Science in Electrical Engineering (MSEE) non-thesis master’s program provides advanced instruction emphasizing engineering practice, making it well suited for practicing engineers who want to grow their knowledge and skill-set but aren’t necessarily pursing a career in R&D. In fact, the MEE program can be counted as one year’s experience towards registration as a Professional Engineer.

A minimum of 30 semester credit hours of graduate studies

Course Requirements:
- A minimum of 18 hours of ECE courses (6000 level or higher)
- 3 to 6 hours of approved, graduate-level electives offered in the College of Engineering or in the College of Business Administration*
- 6 to 9 hours of approved, graduate-level Breadth courses outside of the student’s concentration area offered in the College of Engineering or in the College of Business Administration*

*Elective and Breadth course hours must add up to 12 hours

Course listings and PhD requirements can be found on ece.uh.edu
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.

The industrial engineering department at the UH Cullen College of Engineering is highly-ranked, consisting of top-performing students and world-class faculty and researchers. Industrial engineering graduate students are taught by professors who are actively conducting research in the areas of healthcare and medical decision making, homeland and port security, energy, reliability and maintenance, logistics and transportation, supply chains and manufacturing. Graduate students are exposed to professional and research opportunities throughout their education.

The UH Cullen College of Engineering offers a Master’s degree in IE (MIE), Master of Science (MSIE) degree, and a Ph.D. degree.

**SAMPLE MASTER’S DEGREE PLANS**

**MSIE and MIE students are required to take 5 courses based on the following options:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDE 6372</td>
<td>Advanced Linear Optimization*</td>
</tr>
<tr>
<td>INDE 6333</td>
<td>Probability and Statistics*</td>
</tr>
<tr>
<td>INDE 6377</td>
<td>Human Factors System Design</td>
</tr>
<tr>
<td>INDE 6365</td>
<td>Engineering Economy II</td>
</tr>
<tr>
<td>*Required for MIE</td>
<td></td>
</tr>
</tbody>
</table>

**Students are required to take at least one course from each of the following three categories:**

**Category 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDE 6322</td>
<td>Occupational Safety Engineering</td>
</tr>
<tr>
<td>INDE 6337</td>
<td>Human Facts System Design</td>
</tr>
<tr>
<td>INDE 6365</td>
<td>Engineering Economy II</td>
</tr>
</tbody>
</table>

**Category 2**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDE 6336</td>
<td>Reliability Engineering</td>
</tr>
<tr>
<td>INDE 6363</td>
<td>Statistical Process Control</td>
</tr>
<tr>
<td>INDE 6370</td>
<td>Operation Research-Digital Simulation</td>
</tr>
</tbody>
</table>

**Category 3**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDE 6361</td>
<td>Production Planning and Control</td>
</tr>
<tr>
<td>INDE 6383</td>
<td>Engineering Design and Prototyping</td>
</tr>
<tr>
<td>INDE 7390</td>
<td>Supply Chain Management</td>
</tr>
</tbody>
</table>

No more than 6 semester hours of course work applied to this degree may be taken outside the IE Department. However, prior approval by the IE Graduate Program Director is required.

**Master of Science in Industrial Engineering (MSIE)**

- 30 semester hours of approved graduate courses are required for the MSIE degree. This includes 21 hours of course work, 3 hours of research, and 6 hours of thesis. These requisite degree program hours are in addition to any leveling courses.
- Thesis-based program
- Students whose primary language is not English may be required to complete compulsory engineering communications course (INDE 6359). The engineering communications course is not required for the international students who score 33 percentile or higher on the verbal section of the GRE exam.
- All MSIE students must take INDE 6111 (graduate seminar course) at least once during their studies.

**Master in Industrial Engineering (MIE)**

- 30 semester hours of graduate courses are required for the MIE degree. These requisite degree program hours are in addition to any leveling courses.
- Coursework-based program
- Students whose primary language is not English may be required to complete compulsory engineering communications course (INDE 6359). Engineering communications course is not required for the international students who scored 150 (approximately 45 percentile) or higher on the verbal section of the GRE exam.
- All MIE students must take INDE 6111 (graduate seminar course) at least once during their studies.

Additional course listings and PhD requirements can be found on ie.uh.edu
MATERIALS SCIENCE & ENGINEERING MS | PhD

Materials are everything. For the caveman, it was the rock – for the astronaut on the moon, it was also the rock. Materials engineers develop materials that got us from the cave to the moon, and they continue to lead the way in every area. New materials usher in new technological and economic developments. Our urgent need for new energy sources has led to increasing demands for materials that have unusual engineering properties and applications. These concerns are further compounded by growing difficulties in assuring continuous availability of various strategic materials. For these reasons, the demand for highly-skilled materials engineers has never been greater.

The materials engineering graduate program offers high quality training in fundamentals and applications of technologically-relevant materials to enable successful careers in the competitive and ever changing field. Students are offered a flexible yet demanding curriculum in materials engineering to address the needs of this highly interdisciplinary field. Graduate students are taught by a diverse, interdisciplinary team of faculty who run cutting-edge research programs in areas including bio- and nano-materials, energy storage and delivery, electronic and photonic materials, and advanced polymers. Materials engineering faculty members are developing materials for nanostructured energy storage architectures, molecular biosensors for medical diagnostics, high performance electronics and optoelectronics. Students are provided opportunities to work with modern research instrumentation in state-of-the-art facilities.

SAMPLE MASTER’S DEGREE PLANS

To receive the degree of Master of Science (MS) in Materials Science and Engineering, the student is required to complete at least 30 semester hours of graduate studies as follows:

- 6 credit hours should be from the core: at least 3 credit hours in each of two core categories: Thermodynamics and Introduction to Materials.
- At least 9 credit hours should be in the area of concentration of the student. These courses will be recommended/assigned by the academic advisor.
- At least 6 credit hours of additional coursework listed in Materials Science and Engineering course offering.

Master of Science with Thesis:

- 6 credit hours of core courses in the two categories of Thermodynamics and Introduction to Materials (3 hours in each)
- 9 credit hours of concentration recommended/assigned by academic advisor
- 6 credit hours of additional Material Science and Engineering coursework
- 3 credit hours of research (6X98)
- 6 credit hours of thesis (6399 and 7399)
- Seminar attendance

Materials Science without Thesis:

- 6 credit hours of core courses in the two categories of Thermodynamics and Introduction to Materials (3 hours in each)
- 9 credit hours of additional Materials Science and Engineering coursework
- 18 credit hours of coursework offered by the College of Engineering

Core Course Categories

Thermodynamics:
CHEE 6335 Classical and Statistical Thermodynamics
MECE 6331 Advanced Thermodynamics I
CHEM 6313 Thermodynamics and Kinetics
CHEM 6322 Statistical Thermodynamics
PHYS 6327 Statistical Physics I

Materials Engineering:
MTLS 6300 Physics and Chemistry of Engineering Materials
CHEE 6300 Physics and Chemistry of Engineering Materials
MECE 6363 Physical Metallurgy
ECE 6348 Material Science of Thin Films
CHEM 6375 Physical Inorganic Chemistry II

*Elective courses and PhD requirements can be found on materials.egr.uh.edu
Mechanical engineers are the jacks-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, instrumentation and control of processes, product reliability and safety, materials and polymers.

The graduate program in mechanical engineering provides students with an educational experience grounded in the engineering sciences and focused on producing a professional capable of systematically applying those sciences to solve real-world problems. The mechanical engineering graduate program encompasses advanced study and research in the areas of applied mechanics, control of dynamical systems, materials science, thermal and fluid sciences, and biomedical engineering. Graduate students are taught by the world’s leading mechanical engineering researchers and are prepared to take on leadership positions in industry, government or academia in the Houston region and beyond.

The UH Cullen College of Engineering offers MSME (non-thesis track), MSME (thesis track), MME (non-thesis track), and Ph.D. degrees in mechanical engineering. Students have the option of taking some mechanical engineering graduate courses online.

**SAMPLE MASTER’S DEGREE PLANS**

The MSME program without a thesis requires successful completion of 30 semester hours of course work distributed as follows:

- 3 hours from the course MECE 6384 Methods of Applied Mathematics I
- 9 hours of core courses, consisting of one course from each of the three areas chosen from:
  4. Thermo-Fluids: MECE 6334 Convection Heat Transfer; Advanced Fluid Dynamics I.
- 9 hours of elective courses from the MECE 6000-level or above, exclusive of graduate seminar (MECE 6111) and Graduate Project (MECE 6368).
- 9 hours of elective courses at the 6000-level or above from a list of approved courses in the College of Engineering, the College of Natural Science and Mathematics, the Bauer College of Business, and the UH Law Center, with no more than three hours from one academic unit (department or program).

The MSME program with a thesis requires completion of a minimum of 30 credit hours distributed as follows:

- 9 credit hours of thesis courses (the first three for MECE 6399, the remaining for MECE 7399).
- 3 hours from the course MECE 6384 Methods of Applied Mathematics I.
- At least 9 hours from the MECE 6000-level or above, exclusive of the seminar (MECE 6111), research credits (MECE 6x98), and thesis credits.
- The remaining hours must be at the 6000-level or above from a list of approved courses in the College of Engineering, the College of Natural Science and Mathematics, the Bauer College of Business, and the UH Law Center, with no more than three hours from one academic unit (department or program).

*Elective courses and PhD requirements can be found on me.uh.edu*
Global economies would collapse without it. Life as we know it would cease to exist without oil and gas, and petroleum engineers are the only ones who know how to extract it safely and efficiently from the earth. They solve the most critical and pressing global energy challenges facing humanity, including how to meet increasing global demand for energy while ensuring the safety and cleanliness of our environment.

The vision for the UH Cullen College of Engineering petroleum engineering program is to be the center of world-class petroleum engineering education, research and service in the city of Houston, the center of the world’s petroleum industry. Petroleum engineering graduate students are taught by leading educators with strong research and industrial backgrounds. Students are prepared to address the challenges of the world’s energy needs responsibly, to exceed the evolving expectations of employers in the petroleum and energy industries, to sustain industry leading skills and to be leaders in industry, academia and government.

The UH Cullen College of Engineering offers MSPetE (non-thesis track), MPetE (thesis track), and Ph.D. degrees in petroleum engineering, as well as a graduate-level certificate program in “Unconventional Reservoirs.”

**SAMPLE MASTER’S DEGREE PLANS**

**Master of Science in Petroleum Engineering with Thesis:**
After admission into the Masters of Science in Petroleum Engineering (courses only), students may apply to the Academic Advisor for Petroleum Engineering to pursue a Master of Science in Petroleum Engineering degree with a thesis, if they meet certain requirements below. The Master of Science in Petroleum Engineering requires 24 credit hours of the same approved courses as the non-thesis option beyond the introductory level in Petroleum Engineering plus 6 credit hours dedicated to the Master’s Thesis. Such an option is particularly appropriate for students intending a career in research and who intend to pursue a Ph.D. degree.

**Requirements to transfer from a Masters of Science in Petroleum Engineering Non-Thesis option to a Thesis Option:**
- be admitted into the Masters of Science in Petroleum Engineering (courses only) degree program,
- successfully complete at least 6 credit hours of courses (excluding leveling courses) with grade of B or better,
- identify a faculty member willing to serve as Thesis Advisor and obtain his or her agreement,
- propose a preliminary thesis topic to the Thesis Advisor and the Chair of Petroleum Engineering and obtain their approval,
- form a thesis committee with the approval of the Thesis Advisor and the Chair of Petroleum Engineering

**Master of Petroleum Engineering without Thesis:**
MSPetE requires 30 credit hours of approved courses for admitted students with B.S. in Petroleum Engineering. Admitted students with a different undergraduate engineering degree are also required to complete 12 credits of leveling courses which prepare such students for success in the Masters in Petroleum Engineering Department but which do not count toward the degree.

**Leveling Courses:**
PETR 6351  Introduction to Petroleum Engineering
PETR 6362  Reservoir Engineering I
PETR 6364  Origin/Development of Oil and Gas Reservoirs
PETR 6328  Petroleum Fluid Properties and Phase Equilibria

**Required Courses:**
PETR 6302  Reservoir Engineering II
PETR 6312  Well Logging: Evaluation of Petroleum Formations
PETR 6368  Well Drilling and Completion I
PETR 6372  Petroleum Production Operations

**Advanced Elective Courses:**
PETR 6308  Advanced Petroleum Production Operations
PETR 6310  Petroleum Production Economics
PETR 6304  Core Analysis: Evaluation of Petroleum Formations
PETR 6314  Pressure Transient Testing

*Additional elective courses and PhD requirements can be found on petro.egr.uh.edu
SPACE ARCHITECTURE  MS

The Sasakawa International Center for Space Architecture (SICSA) is a research and design organization within the University of Houston. SICSA brings more than 30 years of internationally recognized experience in habitat research, planning and design for space and extreme terrestrial environments. Such settings share many urgent problems and issues. They typically impose logistic transport challenges for people, equipment and supplies; present severe facility construction and operational constraints; demand careful attention to habitability, performance and safety under isolated, confined conditions; and heavily rely upon all practical means to optimize energy-efficient, ecologically-responsible strategies. Terrestrial planning applications include remote oil and gas exploration/production camps; emergency natural disaster response operations and shelters; and rapid military troop deployment accommodations for harsh, undeveloped locales.

We are academic leaders in the field of space architecture and are also active in planning and design of facilities for extreme environments on Earth. Included are ocean facilities, polar research stations and human disaster accommodations. We hosted a large international and interdisciplinary conference dealing with these topics with 400+ attendees from 12 countries. We offer the world’s only space architecture graduate program which grants a Master of Science-Space Architecture degree with participants that include professionals from NASA and major aerospace corporations along with international students. Our projects and programs have been featured in television and magazine productions throughout the world. SICSA’s clients and affiliates include NASA and numerous other leading aerospace and advanced technology organizations.

Graduate students interested in the related fields of Aerospace Engineering and Space Architecture can combine their studies in a Dual Aerospace Engineering/Space Architecture Master of Science degree program. The dual degree allows students to obtain a M.S. degree in Aerospace Engineering and a M.S. degree in Space Architecture by completing 46 credit hours of relevant graduate coursework. Hence, with the appropriate. Selection of graduate courses within the Aerospace Engineering and the Space Architecture programs students can be awarded both degrees. Hence, the dual degree plan significantly reduces the total number of credit hours needed if the two degrees were pursued separately.

SAMPLE MASTER’S DEGREE PLAN

30 credit hours for full-time graduate students

**Fall Semester**
SPAC 6201  Man Systems Integration  
SPAC 6401  Space Systems Technology Studio  
SPAC 6398  Special Problems/Independent Study  
3 credit-hour elective class eligible for Graduate Program

**Spring Semester**
SPAC 6203  Spacecraft and Habitat Design  
SPAC 6403  Mission Planning and Analysis  
SPAC 6398  Special Problems/Independent Study  
3 credit-hour elective class eligible for Graduate Program

**Fall Semester**
SPAC 6298  Special Problems/Independent Study  
SPAC 6405  Advanced Design and Analysis OR  
SPAC 7410  Master’s Project: Space Architecture

30 credit hours for part-time graduate students

**Fall Semester**
SPAC 6201  Man Systems Integration  
SPAC 6401  Space Systems Technology Studio

**Fall Semester**
SPAC 6203  Spacecraft and Habitat Design  
SPAC 6403  Mission Planning and Analysis

**Fall Semester**
SPAC 6298  Special Problems  
SPAC 6405  Advanced Design and Analysis OR  
SPAC 7410  Master’s Project: Space Architecture
Thousands of feet below the dark ocean waters, subsea engineers shine, carrying out some of the most important and challenging work in the offshore petroleum industry. Subsea engineers have multidisciplinary knowledge and are experts on the equipment, tools and infrastructure required for harnessing energy from the depths of the sea. Ultradeep underwater production environments present unique challenges to engineers, particularly deepwater operations where temperature, pressure and corrosion test the durability of submerged equipment and tools. Most subsea engineering operations depend on automation and remote procedures to construct and repair components beneath the surface of the water.

The University of Houston is the global leader of the subsea engineering field. The UH Cullen College is home to the nation’s first subsea engineering graduate program and leads the international effort to standardize subsea engineering education at universities around the world. Located in the heart of the city of Houston, subsea engineering students have access to job and internship positions at the world’s leading energy companies throughout the region. The subsea engineering curriculum was developed in direct response to current and future industrial workforce needs, ensuring graduates of the program are prepared to address the challenges of the world’s energy needs responsibly, to exceed the evolving expectations of employees in the energy industry and sustain professional skills to be leaders in industry, academia and government.

The UH Cullen College of Engineering offers an MS degree in subsea engineering, as well as graduate-level certificates in subsea engineering, advanced subsea engineering and “Data Analytics for Condition and Performance Monitoring of Engineered Systems.” Students may take subsea engineering courses online or in-person.

**SAMPLE MASTER’S DEGREE PLAN**

**30 credit hours required for this degree**

**Category 1 - Required Courses:**
Every student must take this required three-course sequence.

- MECE 6334 Convection Heat Transfer
- MECE 6384 Methods of Applied Mathematics
- SUBS 6310 Flow Assurance

**Category 2 - Restricted Electives:**
The courses listed below have been specifically developed for the Subsea Engineering Graduate Program. Every student must take at least three of the courses from this prescribed elective list. Students may submit a graduate petition if deviations from this requirement makes sense for individual career paths.

- SUBS 6305 Mathematics for Subsea Engineers
- SUBS 6320 Riser Design
- SUBS 6330 Pipeline Design
- SUBS 6340 Subsea Processing and Artificial Lift
- SUBS 6350 Subsea Controls and Systems Engineering
- SUBS 6351 Design of Subsea Blowout Preventers
- SUBS 6360 Subsea Materials and Corrosion
- SUBS 6370 Computational Methods and Design Experiments
- SUBS 6380 Subsea Systems
- SUBS 6397 Selected Topics in Subsea Engineering

**Category 3 - Electives:**
Categories 1 and 2 have prescribed 6 of the 10 mandatory courses that are required for the MS in Subsea Engineering. This leaves 4 courses that can be selected by the student subject to approval by the Director, through a graduate petition form, prior to taking the course(s). Subsea Engineering is an interdisciplinary engineering field, so students are strongly encouraged to take at least one course from another department or program within the Cullen College of Engineering. However, students may take a Subsea Engineering course as their final elective. The Mechanical Engineering and Petroleum Engineering graduate courses applicable to MS in Subsea Engineering include:

- MECE 6335 Heat Transfer with Phase Change
- MECE 6353 Introduction to Computational Fluid Dynamics
- MECE 6361 Mechanical Behavior of Materials
- MECE 6363 Physical Metallurgy
- MECE 6368 Mechanical Design Project
- MECE 7361 System Identification
- MECE 63XX Selected Courses require approval from Program Director
Established in 2016, the Hobby School’s research component is found within the Center for Public Policy, including programs and initiatives such as the Survey Research Institute, the Concept Visualization Lab, the EITM Summer Institute, and the Civitas Project. Public service and community engagement are also a vital component of the Hobby School as evidenced through Hobby Fellows, Leland Fellows, the Civic Houston Internship Program, the nationally-accredited Certified Public Manager program, the Civic Engagement Boot Camp, and various public events.

The Hobby School of Public Affairs is a Full Member of the Network of Schools of Public Policy, Affairs, and Administration (NASPAA) and Institutional Member of the Association for Public Policy Analysis & Management (APPAM). The Hobby School also maintains a Pi Alpha Alpha chapter, which is the global honors society for public affairs and administration.
The Hobby School of Public Affairs’ Master of Public Policy (MPP) program offers an interdisciplinary degree, which prepares students to conduct advanced quantitative and qualitative analyses. Drawing from political science, psychology, decision sciences and more, MPP graduates will be ready for analytic and decision-making positions in many fields within the public, private, and nonprofit sectors. In addition, MPP graduates will be prepared to enter a PhD program with a quantitative emphasis.

In order to accommodate working students, classes are offered in the evenings, Monday through Thursday from 5:30 p.m. to 8:30 p.m. Academic advising and career placement services will be coordinated by a dedicated Hobby School staff member. The MPP also requires nine hours of more quantitatively-focused classes such as microeconomics, research methods, statistics, and advanced data analysis, six hours in philosophy and research ethics, and three hours for an internship. In addition, students are required to complete a specialization that is six hours, or typically two courses. This specialization and courses are selected by the student and approved by the Hobby School.

The Hobby School doesn’t have a pre-selected list of specializations that must be used. Therefore, students are encouraged to find graduate-level electives throughout the university that fit their interests. The following are some examples of MPP students’ specializations: Governmental Affairs, Health Policy, Higher Education Policy, Nonprofit Management, and Quantitative Methods.

**SAMPLE MASTER’S DEGREE PLAN**

**Course Requirements (39 credit hours):**

- POLC 6311 Leadership and Professional Development
- POLC 6312 Public Finance
- POLC 6313 Policy Analysis I: Microeconomics
- POLC 6314 Policy Research Methods I: Intro to Statistics
- POLC 6315 Policy Research Methods II: Multivariate Analysis
- POLC 6316 Policy Research Methods III: Advanced
- Quantitative Modeling
- POLC 6317 Public Policy Capstone
- POLC 6330 Philosophy and Public Policy I
- POLC 6331 Philosophy and Public Policy II
- POLC 6352 Quantitative Methods & Applications
- POLC 6391 Internship in Public Policy*
- 6 credit hours of approved specialization electives

*POLC 6391 Internship in Public Policy is a required course, but a student may use their current job to satisfy the internship requirement, if the position is related to public policy and approved by the Hobby School. The course requirements will still need to be fulfilled.
The Law Center was established in 1947 and enrolls more than 800 students in its degree programs. We offer J.D., LL.M. and “concurrent” degrees that allow students to obtain two degrees in less time than individual programs would require.

We are currently ranked No. 50 among the nearly 200 law schools in the United States, and we are one of only eight public law schools that offer multiple ‘Top 10’ programs.

The Law Center is truly a “global” school and is well-connected with the international legal and education communities. The international activities of our faculty include visiting professorships, publications in foreign journals, and participation in international symposia and conferences.

We have an outstanding faculty assisted by a large and experienced group of adjunct professors. Recently, our faculty have written nearly 80 books and published nearly 200 articles in leading law journals and other publications.
Houston is the energy capital of the world – and the perfect location to pursue an LL.M. concentration in Energy, Environment and Natural Resources Law. The Law Center has earned an international reputation as a center for research and teaching on the intersection of these laws and related projects, programs and policy. The UH Law Center’s LL.M. program in Energy, Environment and Natural Resources Law trains lawyers to handle the complex legal and policy issues that surround three areas: energy production, transportation, and use; pollution prevention and biodiversity protection; and natural resources exploitation and conservation. Students can focus on one of the three areas or pursue broader studies of the interrelationship between energy development and policies to protect the environment.

Economic and political forces play a role in all of these areas, and applicable law may be local, national, or international in scope. The Law Center curriculum gives students the opportunity to acquire or deepen their analytical and practice skills for a career in these complex subject areas. Faculty with international reputations in energy law and domestic and international environmental policy teach the courses, and a strong corps of adjunct law professors adds important skills and perspectives. In addition to their on-campus work, LL.M. students have many opportunities to network and attend programs on “hot topics” offered by the Association of International Petroleum Negotiators, the World Affairs Council, the Baker Institute’s Energy Forum, and three sections of the Houston Bar Association: Environmental Law; Oil, Gas and Energy Law; and International Law.

**SAMPLE LLM DEGREE PLAN**

Students must complete a minimum of 14 credit hours with 15 credit hours in energy, environment, and natural resources courses, selected from the following:

- LAW 5297  Admiralty Environmental and Insurance Claims
- LAW 6226  Advanced Oil and Gas Contracting
- LAW 5364  Texas Coastal and Ocean Law
- LAW 5313  International Corporate Compliance
- LAW 6316  Energy Law and Policy
- LAW 5335  Land Use
- LAW 5390  Environmental Law
- LAW 5371  International Petroleum Transactions
- LAW 6238  International Risk Management
- LAW 6338  Climate Change Law
- LAW 5397  Climate Intervention Law & Policy
- LAW 6362  Natural Resources Law
- LAW 5355  Oil and Gas
- LAW 5355  Oil and Gaw Law
- LAW 6386  Oil and Gas Tax
- LAW 5334  Environmental Law Practicum
- LAW 6359  Regulated Industries Seminar
- LAW 6362  Natural Resources Law
- LAW 5297  Offshore Energy Development
- LAW 6341  Water Law

- LAW 5397  Hazardous Waste Law
- LAW 7397  International Environmental Law
- LAW 6341  Project Finance
- LAW 5384  Endangered Species and Biodiversity Law
- LAW 5211  Energy and the Environment

*Not all classes are offered every year, and offerings are subject to change. Please check the Law Center website for current course offerings. Lawyers who earned their degree outside of the United States are also required to complete Introduction to American Law and Legal Research and Writing. Courses previously taken at other schools – including the Law Center – may not be credited toward the program requirements.

*Additional courses can be found on law.uh.edu/eenrcenter/*
COLLEGE OF LIBERAL ARTS AND SOCIAL SCIENCES

95 Applied Economics, MA | PhD
96 Public History, MA
APPLIED ECONOMICS

The University of Houston Department of Economics has designed a 12-month master’s degree program in Applied Economics to allow you to obtain these valuable skills. The demand for workers with a background in economics is growing with the increasing complexity of doing business in a global economy. Employers, particularly in business and government, are seeking professionals with strong data analysis skills to aid in providing them with the information they need to make important business decisions. Our program was ranked 7th among MA Applied Economics programs in the United States by TFE Times in 2020.

With an increased reliance on quantitative methods for analyzing business trends and policy issues, the applied economics program at the University of Houston will help you gain valuable job skills that are important to employers in many industry and government positions. Students will develop the following in-demand skills:

- Data management and statistical analysis
- Trend monitoring and forecasting
- Critical thinking/problem-solving
- An understanding of how macroeconomic policy changes can be used to make better business management decisions
- Regression analysis

SAMPLE MASTER’S DEGREE PLAN

Course Requirements:
The masters in Applied Economics is a full-time, 12-month degree with the courses you need to be competitive in the Houston job market and beyond. The 30 semester credit hour (SCH) program begins each fall (12 SCH regular semester) and runs through spring (12 SCH regular semester) with one final 6 SCH class or internship the following summer. Classes are held during the day primarily on Monday, Wednesday and Friday in the fall and spring. If admitted, each student must begin their coursework in the fall semester (the program does not accept spring or summer applications).

Fall Semester (12 credit hours):
ECON 6485 Microeconomic Analysis
ECON 6475 Macroeconomic Analysis
ECON 6465 Econometrics

Spring Semester (12 credit hours)*:
ECON 6351 Economic Forecasting
ECON 6345 Energy Economics
ECON 6340 Health Economics
ECON 6353 Capital Market Economics
ECON 6394 Advanced Quantitative Analysis
*Spring course options may vary

Internship or Thesis:
ECON 6691 Master’s Internship OR
ECON 6693 Master’s Research Project

*Additional courses and PhD requirements can be found on https://www.uh.edu/class/economics/graduate/
MA

PUBLIC HISTORY TRACK

Students can choose from two tracks for the MA in Public History: a 36-hour Non-thesis or a 30-hour Thesis option. The Non-thesis option is designed to prepare students for professional employment in a wide range of public history venues and emphasizes hands-on research and practical training. This option is ideal for students wishing to pursue a career in public history. The Thesis option combines the opportunity to engage in practical public history training with the more traditional research and writing component of a thesis. This is a good option for students who might wish to later pursue a Ph.D. or who want to broaden their skills and training in the field of public history. Both options allow flexibility for students to tailor their coursework to their interests, as well as to engage with the vast public history resources in the Houston area.

The Non-Thesis option is considered the primary degree plan for public history, due to its focus on applied use of skills in practical settings. It serves students who intend to pursue careers in fields such as institutional history, cultural resources management, historical policy and analysis, community history, historical editing, historical archives and records management, and the creation, interpretation, and management of historical exhibits.

SAMPLE MASTER’S DEGREE PLAN

Major-Specific Courses for both Thesis and Non-Thesis Options:

Students must indicate a major field area of study from one of the following:
- United States
- Europe
- Latin America
- Transnational History

Of the four optional plans offered in the department for MA in History, Plan III and Plan IV are considered Public History.

Plan III: Public History Thesis Track
30 hours of credit in graduate-level (6000) courses are required, including coursework, 6 hours of Public History Internship, and 6 hours of thesis credit. A foreign language is required.

Plan IV: Public History Non-Thesis Track
36 hours of credit in graduate-level (6000) courses are required, including coursework and 9 hours of Public History Internship. A foreign language is not required.

*Additional courses and PhD requirements can be found on uh.edu/class/history/graduate/
COLLEGE OF
NATURAL SCIENCES
AND MATHEMATICS

98 Applied Mathematics, MS
99 Atmospheric Sciences, MS | PhD
100 Chemistry, MS | PhD
101 Computer Science, MS | PhD
102 Geographic Information Systems, Certificate
103 Geology, MS | PhD
104 Geophysics, MS | PhD
105 Hydrogeology, Certificate
106 Professional Geosciences Master’s Degree Program - Geology, MS
107 Professional Geosciences Master’s Degree Program - Geophysics, MS
108 Physics, MS | PhD
The Department of Mathematics of the University of Houston offers a Master of Science in Applied Mathematics. The intent of this program is to provide students with training in mathematics appropriate for many professional mathematical positions in industry. In particular, this program is aimed at developing practical computational and analytical mathematical skills required to tackle realistic problems. Recent graduates are employed in the aerospace, engineering, energy, actuarial and financial industries, as well as in biostatistics, and as teachers in high schools and community colleges.

The UH faculty in applied mathematics and computational sciences is internationally recognized for research achievement and teaching. We have excellent computing resources and the university library has an outstanding mathematics collection.

Students take two one-year sequences of core courses chosen from the areas of mathematical analysis, numerical analysis, applied and computational mathematics, and probability and statistics. They also take electives and complete a tutorial project. The tutorial typically involves studying and writing a report on a specific topic involving the application of mathematics, with the guidance of a faculty member.

**SAMPLE MASTER’S DEGREE PLAN**

All pertinent regulations set forth by the University and the College of Natural Sciences and Mathematics in the Graduate Catalog must be observed. Currently the requirements for the MS degree in Applied Mathematics are that a student complete 30 credit hours of courses at the University of Houston with an average grade of B (that is a 3.0 cumulative GPA) and no more than 3 grades below B-. A student must:

- Successfully complete two out the following four basic course sequences:
  - MATH 6360;6361 Applicable Analysis,
  - MATH 6370;6371 Numerical Analysis,
  - MATH 6382;6383 Probability and Statistics,
  - MATH 6366, 6367 Optimization

- Successfully complete another 6 credit hours of courses at the 6000 or 7000 level in the mathematics department, except for MATH 6308, 6309, 6312, or 6313. “Special problems” courses may not be used to satisfy this requirement.

- Complete 6 hours of elective course work approved by the Director of Graduate Studies. The elective courses need not be taken in the Department of Mathematics.

- Complete a tutorial project by completing MATH 6315 and 7315: Master’s Tutorial, under the supervision of a faculty member. Alternatively, the student, with consent of the Director of Graduate Studies, may decide to satisfy this requirement by taking two regularly scheduled classes.

Within these requirements, students are encouraged to pursue their own interests. In particular, the subject matter of the tutorial project is often related to a student’s professional work. It is usually less formal than a thesis but it is expected that the topic chosen will be treated thoroughly and in depth. To pass Math 7315, a student writes a project report which must be approved by his/her supervisor and a summary of the project must be provided to the Director of Graduates Studies.

In addition, students in the Master of Science in Applied Mathematics program may take 18 credit hours from a specialized course list to receive the Computational Mathematics Graduate Certificate, or may take 24 credit hours from another specialized course list to receive the Financial Mathematics Graduate Certificate.
The Department of Earth and Atmospheric Sciences at the College of Natural Sciences and Mathematics offers MS and PhD. degrees in Atmospheric Sciences. It provides students with educational programs that encompass the fundamental principles of the atmospheric sciences and the application of these principles to the study of the atmosphere. We have expertise in atmospheric chemistry, climate change, extreme weather, numerical modeling, regional-to-global air quality, satellite remote sensing, and development of scientific instrumentation. State-of-art facilities include advanced instrumentation and computing resources.

**SAMPLE MASTER’S DEGREE PLAN**

Applicants to the Atmospheric Science MS or PhD programs are expected to have the necessary science and mathematics background and should have successfully completed course work deemed equivalent to the following courses at the University of Houston:

- GEOL 1302 Introduction to Global Climate Change
- GEOL 1350 Introduction to Meteorology
- GEOL 3342 Principles of Air Pollution
- GEOL 3378 Principles of Atmospheric Science
- MATH 2331 Linear Algebra
- MATH 2433 Calculus III
- MATH 3363 Introduction to Partial Differential Equations

Substitution of courses equivalent to those listed above as well as waivers of requirements will be considered on an individual basis. Applicants with a few deficiencies can satisfy those requirements while also taking graduate courses at the University of Houston; these requirements will be listed in an offer letter should the student be admitted. It is normally recommended that a student with 6 or more deficiency courses - e.g., those whose undergraduate degree was in another discipline - work toward a second undergraduate degree in Atmospheric Sciences prior to graduate work.

**Degree requirements:**
Minimum of 30 approved credit hours including 15 credit hours of atmospheric sciences courses at 6000 level or higher, 6 credit hours of thesis, and 9 credit hours of electives.

Students seeking MS in Atmospheric Sciences are required to take at least one course from the three Atmospheric Sciences Graduate Core Categories: 1) Atmospheric Dynamics and Physics, 2) Atmospheric Chemistry, and 3) Atmospheric Measurement and Modeling.

**Thesis Requirements:**
- GEOL 6399 Master’s Thesis
- GEOL 7399 Master’s Thesis

**Category 1: Atmospheric Dynamics and Physics**
- GEOL 6337 Atmospheric Physics
- GEOL 6330 Dynamic Meteorology
- GEOL 6327 Atmospheric Radiation
- GEOL 6397 Mesoscale Meteorology

**Category 2: Atmospheric Chemistry**
- GEOL 6327 Atmospheric Radiation
- GEOL 6332 Air Pollution Meteorology
- GEOL 6334 Atmospheric Chemistry
- GEOL 6370 Atmospheric Biogeochemical

**Category 3: Atmospheric Measurement and Modeling**
- GEOL 6325 Remote Sensing
- GEOL 6335 Atmospheric Numerical Modeling
- GEOL 6328 Atmospheric Data Analysis & Statistics

*Additional courses and PhD requirements can be found on uh.edu/nsm/earth-atmospheric/graduate/overview/index
The Department of Chemistry under the College of Natural Sciences and Mathematics comprises research and studies in three divisions – organic chemistry, inorganic chemistry and physical chemistry. The organic chemistry division spans a wide range of areas, ranging from the synthesis and study of complex natural products and medicinally important compounds to the development of synthetic methodologies to access diverse classes of molecules. Researchers in the inorganic division at UH devise novel synthetic methods to access new catalysts for chemical reactions, to prepare new materials that have applications in magnetism and superconductivity, and to design new molecules and extended solids that possess unique optical properties. In the physical chemistry division, experimental research groups use state-of-the-art instrumentation for nonlinear spectroscopic, magnetic resonance, and ultrafast electron imaging techniques to study the structure and dynamics of complex systems in surface chemistry, electrochemistry, materials science, and biomedicine.

**SAMPLE MASTER’S DEGREE PLANS**

The Department offers two options for the MS degree: a thesis option, with a minimum of 30 approved semester hours, and a non-thesis option with minimum of 30 approved semester hours of formal graduate level courses. In all cases, students must complete six graduate-level courses (no less than 18 credit hours) based on the course requirements in their elected division, as indicated below.

**Inorganic Division**
- CHEM 6374  Physical Inorganic Chemistry I

**FIVE of the following courses:**
- CHEM 6311  Mechanisms
- CHEM 6312  Bonding
- CHEM 6313  Thermodynamics and Kinetics
- CHEM 6314  Spectroscopy
- CHEM 6321  Quantum Chemistry
- CHEM 6332 Inorganic Material Analysis, prerequisite CHEM 6374
- CHEM 6375  Physical Inorganic Chemistry II, prerequisite CHEM 6374
- CHEM 6376  Organometallic Chemistry
- CHEM 6377  Solid State Chemistry, prerequisite CHEM 6374
- PCOL 6345  Drug Design and Discovery

**Two from the following elective courses:**
- CHEM 6312  Bonding
- CHEM 6313  Thermodynamics and Kinetics
- CHEM 6314  Spectroscopy
- CHEM 6332 Inorganic Material Analysis, prerequisite CHEM 6374
- CHEM 6374  Physical Inorganic Chemistry I
- CHEM 6375  Physical Inorganic Chemistry II, prerequisite CHEM 6374
- CHEM 6376  Organometallic Chemistry
- CHEM 6377  Solid State Chemistry, prerequisite CHEM 6374

**Physical Division**
- CHEM 6313  Thermodynamics and Kinetics
- CHEM 6314  Spectroscopy
- CHEM 6321  Quantum Chemistry
- CHEM 6322  Statistical Thermodynamics
- CHEM 6324  Molecular Spectroscopy

In addition to the four required courses, two additional 6000 or 7000-level graduate courses to be decided by the student and his/her advisor.

**Seminar Requirements**
- CHEM 6111  Graduate Colloquium
- CHEM 6112  Graduate Seminar

**Thesis Track**
- CHEM 6399 Master’s Thesis
- CHEM 7399  Master’s Thesis

*Additional courses and PhD requirements can be found on [https://uh.edu/nsm/chemistry/graduate/](https://uh.edu/nsm/chemistry/graduate/)*
The Department of Computer Science at the University of Houston currently educates around 300 graduate students including around 100 Ph.D. students. The department is committed to high-quality, state-of-the-art education and research in the highly diverse and cosmopolitan environment that the University of Houston and the city of Houston provide. Members of the faculty are recognized for their work nationally as well as internationally and have received National Science Foundation CAREER awards, serve as president of the IEEE Computer Society, and serve on the boards of various companies.

The department's teaching and research fields include artificial intelligence, computer networks, computer graphics, computer vision, databases, multimedia computing, high-performance computing, real-time systems, scientific computing and visualization, software engineering, biocomputing and bioinformatics, cyber security, natural language processing and theory. The department maintains state-of-the-art computer equipment including Unix/Linux servers, and students have access to more than 100 workstations and to high-performance computing facilities.

**SAMPLE MASTER'S DEGREE PLANS**

The Department offers two options for the MS degree: a thesis option, with a minimum of 30 credit hours, and a non-thesis option with minimum of 36 credit hours of formal graduate level courses. To obtain a Ph.D., a student must complete a minimum of 72 credit hours. MS students choose between tracks to specialize in key areas within computer science. The MS core computer science track is the default track unless an alternate track is declared. A track can be changed while enrolled in the M.S. program.

**Core Track:**
The Core track balances core components of the computer science program including theory, systems and computational science. Thesis option requires taking at least 4 courses listed below. Non-thesis option requires taking at least 5 courses listed below, with at least 2 courses from Block 1 and at least 2 courses from Block 2.

**Block 1: Theory**
- COSC 6320 Data Structures and Algorithms
- COSC 6342 Machine Learning
- COSC 6364 Advanced Numerical Analysis
- COSC 6369 Theory of Computation

**Block 2: Systems**
- COSC 6340 Database Systems
- COSC 6360 Operating Systems
- COSC 6377 Computer Networks
- COSC 6385 Computer Architecture

**Data Analytics Track:**
The Data Analytics track emphasizes a practical approach to the study of data analytics, imparting fundamentals supported by hands-on skills acquisition and problem solving involving real-world applications. The track facilitates preparation for positions in product development and research in industries pursuing image computing, data mining, and data analysis as well as for advanced studies in the field. Thesis option requires taking at least 4 courses listed below, with at least 3 courses from Block 1. Non-thesis option requires taking at least 6 courses, with at least 3 courses from Block 1.

**Block 1: Introductory**
- COSC 6323 Statistical Methods in Research
- COSC 6335 Data Mining
- COSC 6336 Natural Language Processing
- COSC 6339 Big Data Analytics
- COSC 6340 Database Systems
- COSC 6342 Machine Learning
- COSC 6344 Visualization
- COSC 6368 Artificial Intelligence
- COSC 6373 Computer Vision
- COSC 6380 Digital Image Processing

**Block 2: Advanced Topics**
- COSC 6391 Biomedical Image Analysis
- COSC 7336 Advanced Natural Language Processing
- COSC 7362 Advanced Machine Learning
- COSC 7373 Advanced Computer Vision
- COSC 7378 Advanced Image Computing

**Other tracks include:**
Parallel and Distributed Systems Track
Interactive Media Track

For information on the Computer Science Ph.D. program, visit cs.uh.edu
The graduate certificate in Geographical Information Systems provides students with knowledge and experience to compete and work in the field of GIS in public or private sector. The combination of courses focuses on the acquisition, storing, visualization, modeling, and analysis of information on spatial phenomena with some emphasis on geospatial applications. The certificate is available to both graduate students and non-degree seeking professionals.

**SAMPLE CERTIFICATE PLAN**

The GIS Certificate requires a total of 15 credit hours which will be comprised of 9 credit hours of core courses and 6 credit hours of electives indicated below.

**Core Courses:**
- GEOL 6388  Intro Geographic Info Systems
- GEOL 6325  Remote Sensing
- GEOL 6324  Satellite Positioning & Geodesy

**Elective Course Options:**
- GEOL 6323  Geoscience Applications of GPS and LIDAR
- GEOL 6389  GIS for Geologists
- CIVE 6382  Lidar Systems and Applications
- CIVE 6384  Satellite Altimetry and INSAR
- PUBL 6343  GIS for Urban Applications

**Admission Requirements:**
Students seeking this certificate must have a undergraduate degree in science or engineering and have graduate status at the University of Houston. Well-qualified candidates in other fields may be approved by the GIS Faculty Advisor. A minimum cumulative grade point average (GPA) of 3.00 (A=4.00) is required in the last 60 hours of all course work. For students enrolled in a graduate program, courses used for certification can also be used towards a graduate degree.

A student may be admitted either:
1. to a graduate program in the Department of Earth and Atmospheric Sciences at the University of Houston, or
2. directly to the GIS Certificate program as a “non-degree seeking” graduate student
The Department of Earth and Atmospheric Sciences has a wide range of research programs central to the earth sciences including geology. Geosciences study the development of Earth and are concerned with Earth’s 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. UH faculty and students work on field projects in various remote parts of the world as well as in Texas and the Gulf of Mexico.

SAMPLE MASTER’S DEGREE PLANS

Applicants for a graduate degree in Geology should have successfully completed course work deemed equivalent to the University of Houston's undergraduate BS in Geology. The department will determine any deficiencies or substitutions on an individual basis.

Plan I: Thesis Option (30 credit hours):
• 15 credit hours of formal Earth and Atmospheric Sciences courses (GEOL) at 6000 level or higher
• 6 credit hours of Thesis Courses (GEOL 6399 and 7399)
• 9 credit hours of approved electives

Plan II: Non-Thesis Option (36 credit hours):
• Students on the non-thesis track must take additional coursework and have the option of completing a capstone research project.
• 30 credit hours of formal Earth and Atmospheric Sciences courses (GEOL) at 6000 level or higher
• 6 credit hours of approved electives

In order to ensure breadth, all MS students in Plan I are required to take 3 core courses, and students in Plan II are required to take 5 core courses, with at least one course from 3 of the 4 categories of graduate core courses. Students are encouraged to consult with the Geology Graduate Faculty Advisor to make their selections of the remaining graduate courses. These core categories are:

Category 1: Igneous and Metamorphic Petrology/Geochemistry
GEOL 6341  Geochemistry
GEOL 6386  Igneous Petrogenesis and Plate Tectonics
GEOL 6339  Igneous Petrology
GEOL 6374  Radiogenic Isotope Geochemistry

Category 2: Sedimentary Geology/Stratigraphy
GEOL 6376  Advanced Tect and Sedimentation
GEOL 6366  Hydrogeology
GEOL 6358  Terrigeneous Depositional Systems
GEOL 6380  Sequence Stratigraphy
GEOL 6366  Carbonate Sedimentology

Category 3: Structure/Tectonics
GEOL 6382  Plate Tectonics
GEOL 6352  Microtectonics
GEOL 6350  Advanced Structural Geology
GEOL 6349  Geodynamics
GEOL 6378  Basin Analysis for Petroleum Exploration

Category 4: Applied/Analytical
GEOL 6325  Remote Sensing
GEOL 6347  Sandstone Petrography
GEOL 6372  Petroleum Geochemistry
GEOL 6381  Petroleum Geology
GEOL 6388  Geospatial Analysis and Applications

For information on the Geology Ph.D. program, visit uh.edu/nsm/earth-atmospheric/graduate
Housed in the Department of Earth and Atmospheric Sciences, Geophysics studies physical methods and principles used to understand Earth’s formation and dynamics. Geophysicists study geological occurrences, the Earth’s interior temperature distribution, the origin of the magnetic field, and large-scale crustal features, such as fracture, continental and oceanic ridges. A few popular branches of study include seismology, meteorology, 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.

**SAMPLE MASTER’S DEGREE PLANS**

Applicants for a graduate degree in Geophysics should have successfully completed course work deemed equivalent to the University of Houston’s undergraduate BS in Geology. The department will determine any deficiencies or substitutions on an individual basis.

**Plan I: Thesis Option (30 credit hours):**
- 15 credit hours of formal Earth and Atmospheric Sciences courses (GEOL) at 6000 level or higher
- 6 credit hours of Thesis Courses (GEOL 6399 and 7399)
- 9 credit hours of approved electives

**Plan II: Non-Thesis Option (36 credit hours):**
- Students on the non-thesis track must take additional coursework and have the option of completing a capstone research project.
- 30 credit hours of formal Earth and Atmospheric Sciences courses (GEOL) at 6000 level or higher
- 6 credit hours of approved electives

Students seeking an M.S. degree can choose between a thesis option or a non-thesis option. All students completing the thesis option must complete and defend a thesis acceptable to the department. This option requires a minimum of 30 approved semester hours. In the non-thesis option, completing a thesis is not required, but students must take additional course work to reach a minimum of 36 semester hours and have the option of completing a capstone research project. PhD students who enter the program with or without a prior earned MS degree must complete a minimum of either 24 or 54 approved semester hours, respectively.

To provide a fundamental background in the essential elements of Geophysics, all students seeking an M.S. degree in geophysics and all Ph.D. students entering with a bachelor’s degree are required to take the following four core courses. These core courses are usually offered once each year in Fall or Spring.

**Core Courses:**
GEOL 7330  Potential Field Methods
GEOL 7341  Geophysical Data Processing
GEOL 7324  Rock Physics
GEOL 7333  Seismic Wave and Ray Theory

For information on the Geophysics Ph.D. program, visit uh.edu/nsm/earth-atmospheric/graduate
HYDROGEOLOGY CERTIFICATE

The Hydrogeology Certificate offered by the Department of Earth and Atmospheric Sciences is available to both graduate students and non-degree seeking professionals. This certificate is designed for professionals who wish to be recognized as having a broad background in the area of hydrogeology without completion of an advanced degree. This may include geologists currently working in the petroleum industry who wish to obtain positions in the environmental industry, as well as those with hydrogeology positions but lacking formal course work in that area. Classes for certification are part of the Department of Earth and Atmospheric Sciences regular course offerings and thus are generally offered once every two years.

SAMPLE CERTIFICATE PLAN

Admissions requirements:

Students seeking the Hydrogeology certificate must have completed a bachelor’s degree in geosciences, although civil engineering or other related degrees will be considered. They must have completed undergraduate course work equivalent to that required for a bachelor’s degree in Geology, Geophysics, or Environmental Sciences (Environmental Geosciences Option only) at the University of Houston, or additional course work to make up undergraduate deficiencies may be required. Deficiencies will be noted at the time of admission. Transcripts and GRE scores are both required. For students enrolled in a graduate program, courses used for certification can also be used towards a graduate degree.

A student can be admitted either:

(1) to a graduate program in the Department of Earth and Atmospheric Sciences at the University of Houston, or
(2) to the Hydrogeology Certificate program as a “non-degree seeking” graduate student.

Certificate Requirements:

The certificate requires completion of 15 credit hours from the following courses.

Core Course Requirements (12 credit hours):

- GEOL 6366 Hydrogeology
- GEOL 6341 Geochemistry
- GEOL 6346 Geochemistry of Water-Rock Systems
- GEOL 6388 Geospatial Analysis and Applications

Course substitutions may be allowed on an individual basis, with prior approval from the Hydrogeology Certificate faculty advisor.

Elective Course Options (3 credit hours):

- GEOL 6332 Air Pollution Meteorology
- GEOL 6335 Atmospheric Numerical Modeling
- GEOL 6370 Atmospheric Biogeochemistry
- GEOL 6397 Advanced Environmental Science Field Research

or other approved elective with prior approval from the Hydrogeology Certificate faculty advisor.
The Petroleum Geosciences Program offered by the Department of Earth and Atmospheric Sciences allows working professionals the opportunity to earn their MS in Geology without interrupting their careers, and to obtain a specialization in Petroleum Geology. The curricula consist of focused courses that are delivered in an accelerated sequence to meet the needs and schedules of today’s petroleum geoscientists.

Courses will be taught at UH each year, providing enrollment minimums are met. On-campus programs involve enrollees from local industry, foreign countries and various sponsoring companies. In general, the program consists of three or four courses during fall, spring, and two summer semesters. The program should be completed within 15 months of cohort initiation for the M.S. degree. For planning purposes, electives must be designated and fixed prior to initiation of each program (i.e., the electives must be the same for each student in a cohort). Students electing the M.S. degree program will submit a 3 credit hour special problem project by the last month of the program (Capstone Project). The typical class schedule will be Friday afternoons (4 hours) for four weeks and full days on Saturday (8 hours) for three weeks. On the Wednesday following the fourth week, the final examination will be given. The following week will begin with a new course.

The degree program can also be taught at a sponsor’s site or company location. The sponsor must enroll a minimum of 20 qualified students for this program to be taught at their chosen location. In such cases, the sponsor will also be required to provide all teaching facilities and computer facilities required for geophysical courses. One course will be taught in each month for 10 or 12 months depending on which degree is being sought. Course lectures will normally be delivered in English over 5½ days. During the following 3 weeks students will be able to review the lectures with streaming video and then take a final test at the end of the 4-week period. Time outside of class will be required for completion of exercises. In addition, each M.S. student will submit a 3 credit hour special problem project by the 12th month (Capstone Project).

**SAMPLE MASTER’S DEGREE PLANS**

**Petroleum Geology Specialization Curriculum Includes:**
- 3D Seismic Exploration I
- Advanced Structural Geology
- Applied Biostratigraphy
- Basin Modeling
- Carbonate Sedimentology
- Petroleum Geochemistry
- Petroleum Seismology
- Petrophysics and Formation Evaluation
- Seismic Amplitude Interpretation
- Sequence Stratigraphy
- Terrigenous Depositional Systems
- Capstone Project

**Alternates and Electives:**
- Petrophysics and Formation Evaluation
- Seismic Inversion
- Applied Biostratigraphy
- Integrated Reservoir Characterization
- Principles and Practices of Petroleum Geochemistry in Exploration and Exploitation
- Seismic Migration
- Carbonate Depositional Systems
- Terrigenous Depositional Systems
- Structural Geology
- Rock and Fluid Physics
- Quantitative Basin Analysis
- Depositional Systems
- Structural Geology
- Petrophysics and Formation Evaluation
- Applied Biostratigraphy and Chronostratigraphy
- Tectonics of Mexico and the Gulf of Mexico
- The Seismic Exploration Method
The Petroleum Geosciences Program offered by the Department of Earth and Atmospheric Sciences allows working professionals the opportunity to earn their MS in Geology without interrupting their careers, and to obtain a specialization in Petroleum Geophysics. The curricula consist of focused courses that are delivered in an accelerated sequence to meet the needs and schedules of today’s petroleum geoscientists.

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**SAMPLE MASTER’S DEGREE PLAN**

**Petroleum Geophysics Specialization Curriculum Includes:**
- 3D Seismic Exploration I
- Advanced Structural Geology
- Borehole Geophysics
- Geophysical Data Processing
- Petroleum Geology
- Petrophysics and Formation Evaluation
- Potential Field Methods
- Rock and Fluid Physics
- Seismic Amplitude Interpretation
- Seismic Wave and Ray Theory
- Sequence Stratigraphy
- Capstone Project

**Alternates and Electives:**
- Petrophysics and Formation Evaluation
- Seismic Inversion
- Applied Biostratigraphy
- Integrated Reservoir Characterization
- Principles and Practices of Petroleum Geochemistry in Exploration and Exploitation
- Seismic Migration
- Carbonate Depositional Systems
- Terrigenous Depositional Systems
- Structural Geology
- Rock and Fluid Physics
- Quantitative Basin Analysis
- Depositional Systems
- Structural Geology
- Petrophysics and Formation Evaluation
- Applied Biostratigraphy and Chronostratigraphy
- Tectonics of Mexico and the Gulf of Mexico
- The Seismic Exploration Method
The Department of Physics offers both Master of Science and Doctorate of Philosophy degrees in physics. The MS program is suitable both as a means of professional development and preparation for further graduate study. Students will normally complete the requirements within four terms, starting with the basic “core” courses in classical mechanics, electrodynamics, quantum mechanics, and statistical physics, followed by a number of elective courses or a master’s thesis.

Physicists generally are recognized for their ability to experimentally investigate and theoretically model the real world in ways that further our understanding of it. These skills are highly valued by a variety of industries and graduate degrees in physics prepare students for a wide range of careers in those industries.

Recent graduates of our department currently are employed in the electronics, medical, financial, and energy industries, as well as academia. Our research groups provide world-class training and experience designed to give students the skills that are highly valued by the various industries.

## SAMPLE MASTER’S DEGREE PLANS

### Thesis Option (30 credit hours):
- 15 credit hours of the Core Courses
- 3 - 6 credit hours of Master’s Thesis (PHYS 6X99 and/or PHYS 7X99)
- The student must present an acceptable thesis of original scientific research in physics and defend it orally before the thesis committee. Copies of the final draft of the thesis must be given to the members of the committee prior to the deadline published in the Academic Calendar. The student must provide copies to the committee at least two weeks, and preferably one month, prior to the defense. Written announcement of the thesis defense must be sent to the physics graduate faculty at least one week prior to the thesis defense.
- The student must maintain a B average in the core graduate courses and may not make more than two B- grades in the core courses listed above.

### Non-Thesis Option (36 credit hours):
- 15 credit hours of the Core Courses
- 21 credit hours of approved electives in advanced physics and/or other approved courses
- An advisor will be assigned to each non-thesis master’s student from among the physics faculty belonging to the Graduate Studies Committee. The Graduate Studies Committee chairman, or the department chairman, will have the responsibility to make this assignment during the student’s first semester of graduate work. Students must discuss all their course plans with their advisors, and to gain approval for a given course load before the beginning of each semester.
- The student must maintain a B average in the core graduate courses and may not make more than two B- grades in the core courses listed above.

### Core Courses for both Thesis-Track and Non-Thesis Track:
- PHYS 6303 Methods of Mathematical Physics I
- PHYS 6309 Advanced Mechanics I
- PHYS 6315 Quantum Mechanics
- PHYS 6321 Electrodynamics
- PHYS 6327 Statistical Physics

For information on the Physics Ph.D. program, visit [uh.edu/nsm/physics](http://uh.edu/nsm/physics)
COLLEGE OF TECHNOLOGY

110 Engineering Technology - Biotechnology, MS
111 Construction Management, MS
112 Engineering Technology - Mechanical Engineering, MS
113 Petroleum Technology, Certificate
114 Supply Chain & Logistics Technology, MS
115 Technology Project Management, MS

Additional degree(s) offered:
Engineering Technology - Computational Health Informatics Track, MS
Engineering Technology - Network Communications Track, MS
The Master of Science in Engineering Technology - Biotechnology Track emphasizes bioprocessing, protein engineering, computational biology, and federal regulations. Designed to help prepare individuals to conduct or supervise research and development in biotechnology or medical fields. This degree is a highly inter- and multi-disciplinary and its flexibility will allow students to tailor coursework to meet their individual career goals. Students may choose a thesis or project option for completion of the Master of Science in Engineering Technology - Biotechnology Track.

The Master of Science (MS) in Engineering Technology - Biotechnology Track may be completed under the thesis option or project option. This program emphasizes bioprocessing, protein engineering, computational biology, and federal regulations. Designed to help prepare individuals to conduct or supervise research and development in biotechnology or biomedical fields. This degree is a highly inter- and multi-disciplinary field that defines interdisciplinary education and research in the 21st century.

**SAMPLE MASTER’S DEGREE PLAN**

The following is a list of courses required of all students pursuing the Master of Science in Engineering Technology - Biotechnology Track. With this degree, students may choose a thesis or a project option.

**Course Requirements for an Master of Science in Engineering Technology - Biotechnology Track:**

**Thesis Option (31 semester hours):**
- 7 credit hours core courses
- 18 credit hours of specialization track courses*
- 6 credit hours thesis courses (BTEC 6399)

*With approval, 6 credits may be out-of-department electives

**Project Option (34 credit hours):**
- 7 credit hours core courses
- 24 credit hours of specialization track courses*
- 3 credit hours of Master’s Project (BTEC 6396 Master’s Project in Biotechnology)

*With approval, 6 credits may be out-of-department electives

**Core Courses for Thesis and Project Options:**
- BTEC 6100 Seminar in Biotechnology
- TECH 6360 Experimental Design and Analysis
- TEPM 6301 Project Management Principles

**BTEC Course Options:**
- BTEC 6101 Advanced Biotechnology Techniques Methods
- BTEC 6300 Standards in Biotechnology
- BTEC 6302 Introduction to Regulatory Affairs
- BTEC 6303 Protein Engineering Technology
- BTEC 6304 Computational Methods in Biotechnology
- BTEC 6401 Bioprocessing in Biotechnology
- BTEC 6307 Advanced Cell Biology (course only option)
- BTEC 6397 Special Topics in Biotechnology
Business value and seek out managers with advanced technical knowledge and leadership skills. Earning a Master of Science degree in Construction Management at the University of Houston positions you on a direct pathway for continued success in this challenging and rewarding career. Our experienced faculty and intensive curricula prepare students with a range of practical and technical skills like estimating, scheduling, contract administration, and project management. You will be among the best prepared to apply your knowledge to practical work through training in advanced topics, such as risk analysis, sustainability, information management, industry best practices, quality management, and leadership theories.

The Construction Management Master’s degree program provides the knowledge and skills essential for successful leadership positions in the construction industry. The curriculum focuses on both fundamental knowledge and advanced topics. Fundamental courses include estimating, scheduling, contracting, and project management and advanced courses include risk analysis, decision making, computer applications in construction, sustainability and green construction, quality management, and Six-Sigma. Our graduates are prepared to work in the construction industry and in academia.

**SAMPLE DEGREE PLAN**

**Thesis/Project Option: Course Requirements (30 credit hours):**
- 6 credit hours of Core Courses
- 18 credit hours of approved electives
- 6 credit hours of thesis courses (CNST 6396)

**Non-Thesis/Course Only Option: Course Requirements (30 credit hours):**
- 6 credit hours of Core Courses
- 24 credit hours of approved electives

**Core Courses for Thesis and Project Options:**
- TECH 6360 Experimental Design and Analysis
- TTEM 6301 Project Management Principles
- CNST 6307 Statistical and Optimization Methods in Construction Management
- CNST 6308 Data Analysis in Construction Management

**Electives:**
- CNST 6310 Construction Contract Administration
- CNST 6320 Cost Analysis and Bidding
- CNST 6330 Project Planning and Management
- CNST 6336 Introduction to the Oil and Gas Industry
- CNST 6340 Best Practices in Construction
- CNST 6350 Decision Making and Risk Management
- CNST 6360 Computer Applications in Construction Management
- CNST 6370 Quality Management and Six Sigma in Construction Management
- CNST 6380 LEED and Green Construction Principles in Construction Management
- CNST 6390 Leadership for Construction Managers
- CNST 6375 Building Information Modeling Applications in Construction Management
The Master of Science in Engineering Technology - Mechanical Engineering Technology Track graduate program builds upon our recognized mechanical undergraduate degree, providing students with highly developed expertise in design and analysis of mechanical systems. With state-of-the-art teaching and research laboratories, the MS program offers courses and cutting-edge research experience in several applied areas including, instrumentation and measurement, biomedical systems, advanced materials design, manufacturing, systems integration, oil and gas applications, and energy. Our students come from diverse undergraduate backgrounds including technology, engineering, computer science, mathematics, and the natural sciences. Under the guidance of research faculty, the MS students are encouraged to complete their degree with a thesis but have the option to replace the thesis with additional class-work and a faculty mentored project. Throughout graduate training, individuals improve oral and written communication skills helping to positioning them to be industry leaders in their fields of specialty.

SAMPLE MASTER’S DEGREE PLANS

Course Requirements for the Master of Science in Engineering Technology - Mechanical Engineering Technology Track:

Thesis Option: 30 semester hours, or 10 three-credit courses
- 3 credit hours core courses
- 21 credit hours of emphasis area
- 6 credit hours outside electives
- 3 credit hours thesis courses (MECT 6399)

Project Option: 30 semester hours, or 10 three-credit courses
- 3 credit hours core courses
- 21 credit hours emphasis area
- 6 credit hours outside electives
- 6 credit hours research courses (MECT 6396 & MECT 6398)

Core Course for Thesis and Project Track:
MECT 6305  Analytical Methods in Engineering Technology

Prescribed Electives:
MECT 6322  Computer Aided Engineering I
MECT 6340  Materials Selection and Management
MECT 6397  Selected Topics in Mechanical Engineering Technology:
- Materials Selection for Energy Sources
- Energy Systems Economics
- Applications in Stress Analysis
- Rheology Of Energy Related Fluids
- Fundamentals and Applications of Fuel Cells
- Applied Heat Transfer
- Advanced Fluid Mechanics
The Petroleum Technology Initiative (PTI) is an energy industry workforce development venture that complements current UH programs for students and assists experienced employees and project teams in companies.

Established in 2007 by Jack Christiansen, the PTI’s mission is to equip students and experienced professionals with knowledge and skills needed to find a solution for challenges facing Energy Industry, enhance their technical and professional competence and ability to create more value to the Companies.

During the academic year, the Petroleum Technology Team works with industry and academia experts to organize special courses, programs, workshops, and professional industry-UH events to provide additional learning opportunities to the students interested in finding job and leading successful careers in the oil and gas industry.

**SAMPLE CERTIFICATE PLAN**

The Petroleum Technology Certificate is awarded to the students who take at least three (3) PTI elective courses and accumulated at least 20 Professional Development hours.

**Follow these steps to obtain a Petroleum Technology Certificate:**

- Sign up for selected Petroleum Technology Electives
- Notify the College of Technology that you signed up for, completed, or plan to enroll in selected Petroleum Technology Electives and provide your contact information. This will help us to provide you with more details, updates, track your accomplishments, and award you a Petroleum Technology Certificate upon successful completion of the requirements.
- Use any opportunity to participate in the extra-curricular events conducted by PTI, academia and/or industry subject matter experts, professional societies and organizations, and their UH student chapters - PTI partners.
- Keep your personal Student Professional Development and Continuous Learning Efforts RECORD.
- If you have already completed the requirements above, please contact us at PetroleumTechnology@uh.edu.

**Petroleum Technology Electives**

- MECT 4328  Fundamentals of Pipeline Design
- MECT 4332  Fundamentals of Drilling Technology
- MECT 4337  Downhole Drilling Tools and Technology
- MECT 4326  Fundamentals of Offshore Systems
- MECT 4330  Valve Design
- MECT 4394  Horizontal Drilling Technology
The Master of Science in Supply Chain and Logistics Technology is designed for the professional who seeks advanced preparation in logistics, inventory management, transportation, sales, and procurement. Core courses focus on the development of project management skills that are designed to prepare graduates for responsible leadership roles in technology and information-based workplaces. Course topics in the area of emphasis include distribution evaluation, multi-national distribution, distribution strategies, and procurement strategies.

Why are Dell and Wal-Mart so successful? It’s because of the understanding and execution of effective logistics operations. They understand how each part of the supply chain interacts with each other. Do you buy more supplies at a lower price and store them or do you buy less, pay more, but have less inventory and storage costs? Do you ship via air or truck? Do you buy from China or Mexico? What works best for each situation?

**SAMPLE MASTER’S DEGREE PLANS**

**Thesis-Track Course Requirements (30 credit hours, or 10 three-credit courses):**
- 12 credit hours of core courses
- 6 credit hours of required TEPM specialized courses
- 6 credit hours of approved electives
- 6 credit hours of research courses

**Project-Track Course Requirements (30 credit hours, or 10 three-credit courses):**
- 12 credit hours of core courses
- 6 credit hours of required TEPM specialized courses
- 6 credit hours of approved electives
- 6 credit hours of research courses

**Course Only-Track Course Requirements (30 credit hours, or 10 three-credit courses):**
- 12 credit hours of core courses
- 6 credit hours of required TEPM electives
- 6 credit hours of approved electives
- 6 credit hours of research courses

**Core Course Requirements**
- SCLT 6314 Measurement and Evaluation of Supply Chain Operations
- SCLT 6316 Global Supply Chain Logistics
- SCLT 6318 Supply Chain Strategies
- SCLT 6329 Procurement Strategies

**TEPM Specialization Course Requirements:**
- TEPM 6301 Project Management Principles
- TEPM 6304 Quality Improvement in Project Management

**TEPM Electives:**
- TEPM 6302 Leadership and Team Building
- TEPM 6303 Risk Assessment in Project Management

**Research Courses:**
- TEPM 6391 Project Management Seminar
- TEPM 6395 Integration Project
- SCLT 6399 Master’s Thesis
A Master of Science degree in Technology Project Management is designed specifically to prepare individuals with undergraduate degrees in technology disciplines for responsible leadership roles in the technology-based and professional workplaces. The core courses provide in-depth preparation in project management skills. Being able to plan and manage technology projects is an increasingly important skill for those with a technical background.

Graduates are prepared to fill vital management and supervisory roles in a wide range of industries. Students in the program have reported that they have been able to apply the skills they learn across a wide variety of occupations including: Project Manager, Team Lead, Analyst, Process Engineer, Quality Manager, Information Services Manager, Logistics Manager, Finance Manager, Senior Sourcing Specialist, Engagement Manager, Operations Management and Business Development Manager.

These occupations are spread across several industries such as banking/finance, manufacturing and production, merchandising and retail, K-16 education, engineering, architecture, hospital and health services, government, military, telecommunications, non-profits, legal services, public utilities, information technology consulting, energy/oil and gas, construction, and software development.

**SAMPLE MASTER’S DEGREE PLAN**

**Course Requirements (30 credit hours, or 10 three-credit courses):**
- 24 credit hours of required TEPM courses
- 6 credit hours of research courses

**Required Courses:**
- TEPM 6301 Project Management Principles
- TEPM 6302 Leadership and Team Building
- TEPM 6303 Risk Assessment in Project Management
- TEPM 6304 Quality Improvement in Project Management
- TEPM 6305 Project Manager Tools
- TEPM 6306 Project Management Office
- TEPM 6307 Advanced Project Management
- TEPM 6308 Project Procurement Practices

**Research Courses:**
- TEPM 6391 Project Management Seminar
- TEPM 6395 Integration Project
Energy-industry workers need to understand sustainable energy development and the industry’s expanding use of data analytics more than ever as companies shed jobs because of low prices for oil and gas.

The University of Houston will offer two micro-credentialing programs targeting those skills. The programs are in Upstream Data Analytics, presented in partnership with NExT, a training company owned by Schlumberger, and Sustainable Energy Development.

Courses are designed for rising seniors in related fields and/or energy-industry professionals.

117, Energy Data Analytics Program  
118, Sustainable Energy Development Program
**ENERGY DATA ANALYTICS PROGRAM**

Energy professionals – current and future – have to gain deeper insights into operational data for making tougher decisions. UH Energy’s new Upstream Energy Data Analytics Program answers this need for the upstream oil and gas industry. Designed and presented by leaders from industry and accomplished faculty from the University of Houston, the program provides a structured series of micro-credentials or “badges” that will provide the necessary data sciences skillset to facilitate developing solutions to current and emerging challenges using advanced data-based decision making.

The oil and gas industry is undergoing significant changes, including repositioning operations to be cost-competitive in a world of low oil prices, and meeting the growing demands of energy in a sustainable way. This requires working in smarter and more efficient ways. Innovation has always been at the core of the oil and gas industry. Many oil and gas companies are already finding ways to implement data sciences solutions and are realizing tangible benefits, including competitive advantage.

For this reason UH Energy, at the University of Houston, has developed the Upstream Energy Data Analytics Program, to equip current and aspiring professionals in the upstream oil and gas industry on data analytics concepts and hands on experience on applications with real world examples. UH Energy will deliver the program in collaboration with NExT, a Schlumberger Company, UH Departments of Earth & Atmospheric Sciences and Petroleum Engineering and the HPE Data Sciences Institute at UH.

**SAMPLE PROGRAM PLAN**

**Program Overview:**
The program will be offered in 15 hour modules, each over a 4-week period. Digital badges are awarded for each module, and sets of three badges earns a belt. The badges and belts provide a permanent record, endorses by UH Energy and the University of Houston, that can be made a part of your resume to credential your new skills.

**Program Prerequisites**
- Rising senior in a bachelor’s degree program in engineering, technology or business with an understanding of upstream oil and gas operations such as seismic, drilling and production **OR**
- Upstream Oil and Gas Industry Professional

**BRONZE BELT - Introductory**
The Bronze Belt provides the participants with the tools and techniques to build and evaluate data-driven models via the machine learning approach. It covers the data analytics techniques to extract knowledge from raw data by building data-driven models. All aspects of data-mining – data exploration, data preprocessing, machine learning modeling, and model evaluation – are covered. The sessions combine theoretical knowledge with hands-on training of the data analytics techniques using real oil and gas datasets.

**SILVER BELT - Intermediate**
The Silver Belt is designed to provide the foundations of Python programming for developing powerful and reusable data analysis models and Text Analytics. The students will get hands-on training on writing programs to facilitate discoveries from data. The topics include data import/export, data types, control statements, functions, basic data processing, and data visualization.

**GOLD BELT - Advanced**
The Gold Belt will introduce participants to tools and techniques for building and interpreting valid models for time series data using examples in the upstream oil and gas industry. Participants will also be introduced to fundamentals of Deep Learning, as well as Convolutional Neural Networks and Recurrent Neural Networks. Hands on sessions will focus on building CNN and RNN using the Keras library in Python.

*For more information and to apply go to: https://uh.edu/uh-energy/edac-program/*
Society today has three fundamental expectations for our energy future: It must be affordable, accessible and reliable, and environmentally responsible. These requirements make up the Energy Trilemma. Advancing solutions that simultaneously satisfy all elements of this trilemma are the foundation and essence of Sustainable Energy Development. To meet this challenge, and in response to the needs identified by key leaders in energy, UH Energy has developed the Sustainable Energy Development Program. It is an interactive online program, to equip you – the rising energy professional – with skills, knowledge and expertise to tackle the Energy Trilemma.

Energy professionals – current and future – have to be informed and equipped for an industry that is in transition. UH Energy’s new Sustainable Energy Development Program answers this need. Designed and presented by leaders from industry and accomplished faculty from the University of Houston, the program provides a structured series of micro-credentials or “badges” that cover the changing energy landscape and build the skills to succeed in it. Each badge is a 15-hour module, delivered over a 4-week period, and the badges are stackable.

**SAMPLE PROGRAM PLAN**

**Program Overview:**
The program will be offered in 15 hour modules, each over a 4-week period. Digital badges are awarded for each module, and sets of three badges earns a belt. The badges and belts provide a permanent record, endorses by UH Energy and the University of Houston, that can be made a part of your resume to credential your new skills.

**Program Prerequisites**
- Rising senior in a bachelor’s degree program in engineering, technology or business with an understanding of upstream oil and gas operations such as seismic, drilling and production OR
- Upstream Oil and Gas Industry Professional

**BRONZE BELT - Introductory**
The Bronze Belt provide a framework for the Energy Trilemma and the key ingredients of sustainable development and decision-making. This is designed to ask and answer the key questions in each of the energy markets – oil & gas, petrochemicals, and electric power, inclusive of renewables and storage. The framework is structured within a life-cycle analysis and techno-economic modeling discipline.

Badge 1: Energy Transition
Badge 2: Energy Value Chain
Badge 3: Evaluating Sustainable Energy Options

**SILVER BELT - Intermediate**
The Silver Belt builds upon the bronze belt and provides a deeper look at sustainability assessments and options from the beginning to end of the energy value chain.

Badge 1: Sustainability of Generation & Distribution
Badge 2: Sustainability of Transportation & Storage
Badge 3: Sustainability of Energy Systems

**GOLD BELT - Advanced**
The Gold Belt provides tools and techniques to evaluate technical and business solutions for the development of sustainable energy solutions that encompass carbon management and socially responsible investments. The focus of the evaluation is business feasibility, environmental impact, scale-up and implementation, and overall business viability.

Badge 1: Development of Enterprise Sustainability Goals
Badge 2: Evaluating Business Viability
Badge 3: Management & Implementation

*For more information and to apply go to: [https://www.uh.edu/uh-energy/sed-program/](https://www.uh.edu/uh-energy/sed-program/)*
Schedule a Visit

A visit is worth a thousand words, so check us out first hand! Our UH Ambassadors are here to show you what makes us a great university. There are several ways to visit to the University of Houston. Pick the one that fits your schedule and interest.

Choose How You Would Like to Visit:

**Campus Visit**
Campus tours for prospective students and guests are given Monday through Friday at 10 a.m. and 2 p.m.; and every third Saturday at 11 a.m. Registration for campus tours is not necessary, but is appreciated. The visit includes a 20-30 minute admissions and campus life presentation followed by a 60-90 minute walking tour (includes Housing and Residential Life).

**Group Tour**
If your group consists of 10 or more students, we ask that you register for a group tour. Please be sure to register for the correct age group, as we tailor each tour for the specified group. College/High School Group tours (9th grade and above) are given Monday/Wednesday/Friday at 9 a.m. and Tuesday/Thursday at noon. Elementary/Middle School tours (below 9th grade) are given Tuesday/Wednesday/Thursday at 11 a.m.

Registration for group tours is required at least 3 weeks in advance: ssl.uh.edu/admissions/connect/schedule-visit

Also available:
Walking Audio Tour | Cougar Preview | Virtual Tour

**University Tour Contacts:**

Request Information on the University of Houston
uh.edu/future-students

Tour Options:
uh.edu/uhtours

Tour Visit Coordinator:
(832) 842-9060
vc@uh.edu

**University of Houston Degree/Certificate Program Catalogs:**

To access all official University of Houston catalogs, visit catalog.uh.edu
Apply as a Freshman

Check our admission deadlines and freshman admissions requirements. Below you will find the steps to apply as a freshman:

1. The application. Go to applytexas.org and submit your ApplyTexas application for the University of Houston (main campus).
2. The $75 Application Fee ($90 for international applicants). Pay the nonrefundable $75 application fee when you submit your ApplyTexas application or mail a check or money order to the Office of Admissions. Your check or money order must be payable to: University of Houston.
3. Send your test scores. Official SAT or ACT scores should be sent directly to UH from the testing agency. The University of Houston SAT code is 6870 and the ACT code is 4236. SAT and ACT policy allows students to send test scores to several colleges. The University of Houston will accept the SAT (tests administered prior to March 2016) or the redesigned SAT (tests administered since March 2016) for applicants. Official test scores must have been taken with the last five years.
4. Send your high school transcript. Send your official high school transcript with class rank and graduation plan. Official high school transcripts must be sent directly to University of Houston (main campus) from your high school. Your high school counselor or registrar can help you with this process. For fast processing, ask your school to send your transcripts using TREx (for Texas schools only). Please allow 3-5 business days to match your transcript to your file.

If your school cannot send TREx transcripts, UH accepts the following methods:

The methods below may take a month to match your transcript to your file:
1. Transcripts sent by Parchment, Naviance, etc. (If the service your school uses requests an email address, please use transcripts@uh.edu.)
2. Transcripts sent by mail to the Office of Admissions.

Please Note: UH does not accept faxed transcripts or transcripts sent by students via email attachment.

If you also are seeking admission to The Honors College, please select the appropriate checkbox on the ApplyTexas application and submit the supplementary materials.

Admissions Contacts:

Transfer Admissions: uh.edu/admissions/apply/apply-transfer
Transfer Admissions Counselor uh.edu/admissions/
Graduate Admissions: uh.edu/graduate-school/admissions/how-to-apply

International Students: uh.edu/admissions/apply/international
Veteran Admissions: uh.edu/future-students/veterans
Former UH Students: uh.edu/admissions/apply/re-apply-former-student

Office of Admissions
University of Houston
Office of Admissions
Welcome Center
4434 University Drive
Houston, TX 77204-2023
UH AT A GLANCE

46,000 Students
2,600+ Faculty
30 Energy-related Undergraduate Programs
46 Energy-related Graduate & Professional Programs
11 Energy-related Graduate Certificates
29 Research Centers
1ST In the Nation Subsea Engineering Master’s Program
#2 Most Diverse University By U.S. News & World Report
HOUSTON’S ENERGY UNIVERSITY