

## College of Engineering

**Departments:** Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering

**Jack R. Hopper, Dean**

**2016 Cherry Engineering Building  
Phone 880-8741**

**Ronald Peevy, Director  
Recruiting and Cooperative Education**

**2612 Cherry Engineering Building  
Phone 880-7870**

**Katrina Brent, Director  
Engineering Marketing**

**2616 Cherry Engineering Building  
Phone 880-7797**

**Becky Caddy, Director  
Advisement and Retention Center**

**2612 Cherry Engineering Building  
Phone 880-8810**

**Debbie Graves, Executive Assistant**

**Engineering Endowed Chair Professors:**

## Cooperative Education Program

A Cooperative (Co-op) Education Program, in which the student spends alternate terms at work and at study, is offered to qualified students in the College of Engineering. Internships for work periods in summer terms only are also offered. Programs are available for engineering and industrial technology students.

To meet the minimum qualifications for the Co-op program a student must

1. Complete all the work in the first two semesters of the degree program.
2. Maintain a 2.5 over-all grade point average.

To remain in the program, the student must maintain a grade point average above a 2.5 and perform in a manner satisfactory to the employer and Lamar University.

A co-op is considered to be a full-time student during any work term in which the co-op7(a)TJ15()-154(t)-15

## Entrance Requirements

Entering freshmen and new transfer students are considered provisional majors. The College of Engineering Advisement Center is responsible for the academic advisement of provisional engineering majors.

The entrance requirements from high school for engineering degree programs are

1. English .....4 units
2. Mathematics
  - Algebra.....2 units
  - Geometry..... 1 unit
  - Pre-calculus or Equivalent..... 1 unit
3. Natural Sciences
  - Chemistry..... 1 unit
  - Physics..... 1 unit
4. Foreign Language ..... 1 unit

Students who meet the general entrance requirements of the University, but lack in specific requirements for the engineering curricula may, upon approval of the dean, be permitted to enroll in the College of Engineering; however, all deficiencies must be removed before the end of the second academic year. Students having entrance deficiencies or weaknesses are urged to use the summer terms proceeding the Freshman year in college to remove them. Students attaining a sufficiently high grade in the CEEB Mathematics Level I exam may be eligible for advanced placement in the Calculus and Analytic Geometry sequence. These tests are administered during the freshmen orientation periods and during the regular registration periods.

Transfer students are required to have a minimum 2.0 GPA on all work attempted before entering the College of Engineering. Normally transfer credit is considered for course work with a grade of "C" or better.

## Standards

In addition to the University requirements, the College of Engineering enforces the following standards:

1. Students are required to take courses in the sequence shown in the University Bulletin for each degree program.
2. Engineering students are expected to maintain a GPA of 2.25 to remain in a program. Students who drop below 2.25 GPA will be placed on probation (maximum load of 13 semester hours). Students who drop below a 2.0 GPA will be suspended from the College of Engineering for one long term. Students returning from suspension must prepare a performance contract in consultation with their academic advisor. A minimum term of the contract requires the student to remove deficiencies every semester of enrollment. Students who fail to meet the terms of their contract will be permanently suspended.
3. Engineering students are expected to maintain a minimum GPA of 2.0 in their major courses (Any course with an Engineering prefix.) A performance contract with the student's department head is required for continued enrollment.
4. Degree credit is normally allowed only for courses in which a grade of "C" or better is earned. A course may be repeated for additional credit toward a degree only as specified by the official course description in the University Bulletin. Excluding courses that may be taken for additional credit toward a degree, a student may not register for any course more than four times. Any student who wishes to repeat a course must do so before completing a more advanced course in the same subject matter field.

5. Upon the completion of at least 51 semester hours of the Common Program with a GPA of 2.25 or more on all required courses, a student will be considered for admission to an engineering program. For all engineering programs, it is required that 45 semester hours (at least 25 semester hours in engineering at the 3000 and 4000 level) be earned after admission to the professional program.

6. The student's advisor must approve all electives.

The Dean of Engineering may require students to meet the current degree requirements or program standards.

Please see each department's four-year suggested program of study.

## Engineering Courses (ENGR)

The following courses are common to all engineering programs.

<b>4101, 4201, 4301 Special Topics</b>	<b>1-4:A:0</b>
An investigation into specialized areas of engineering under the guidance of a faculty member. This course may be repeated for credit when topics of investigation differ.	
<b>4306 ENGR Internship 1</b>	<b>3:3:0</b>
Internship opportunity provides experience in the practice of engineering for undergraduate students. Its purpose is engineering career development.	
<b>4307 ENGR Internship 2</b>	<b>3:3:0</b>
Internship opportunity provides experience in the practice of engineering for undergraduate students. Its purpose is engineering career development.	
<b>4308* ENGR Internship 3</b>	<b>3:3:0</b>
Internship opportunity provides experience in the practice of engineering for undergraduate students. Its purpose is engineering career development.	
<b>4309* ENGR Internship 4</b>	<b>3:3:0</b>
Internship opportunity provides experience in the practice of engineering for undergraduate students. Its purpose is engineering career development.	

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*Pending approval by the Texas Higher Education Coordinating Board*

## Department of Chemical Engineering

Program accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

**Department Chair:** Thomas Ho

**101 Lucas, Phone 880-8784**

**Professors:** Hopper, Yaws, Li, Chen, Ho

**Gill Chair in Chemical Engineering and Chemistry:** Cocke

**Associate Professors:** Gossage, Lou, Richmond

**Assistant Professors:** Lin, Tadmor, Xu

**Research Assistant Professor:** Wang

**Laboratory Technician:** Kelly Clarke

**Administrative Associate:** Dewanna Campbell

Chemical engineering is the profession in which a knowledge of mathematics, chemistry and other natural sciences gained by study, experience and practice is applied with judgment to develop economic ways of using materials and energy for the benefit of mankind. The chemical engineer enters into almost every modern industry. From petroleum to synthetic rubber, from semiconductor to medicines, the chemical engineer engages in design, research, development, production, sales and management. Among the fields in which the chemical engineer is of prime importance are petroleum, petrochemicals, metals, plastics, paints, drugs and foods, paper, glass, dyes, synthetic fibers and a host of others.

The Department of Chemical Engineering will permit transfer of up to 78 semester hours from a junior college or a community college, if appropriate courses were taken at the junior (community) college level. The appropriate list of courses for a 2 1 Tf9 0 02 Tmcu

## Bachelor of Science – Chemical Engineering

### Suggested Program of Study – Total Min. Hours: 141

#### First Year

Fall Semester	Spring Semester
ENGL Comp ..... 3	ENGL Comp ..... 3
MATH 2413 Calculus & Anal Geom I ..... 4	MATH 2414 Calculus & Anal Geom II ..... 4
CHEM 1411 Gen Chemistry ..... 4	CHEM 1412 Gen Chemistry ..... 4
INEN 1101 Intro Engineering ..... 1	*ELEN 1301 Eng Computers I ..... 3
PHIL 1370 Philosophy of Knowledge ..... 3	PHYS 2425 Mechanics & Heat ..... 4
PEGA ..... 1	
Fine Arts ..... 3	
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19	18

#### Second Year

MATH 3370 Statistics ..... 3	Soc Sci Elective ..... 3
PHYS 2426 Elec, Mag, Lt.snd ..... 4	CHEM 3401 Quant Anal ..... 4
INEN 2273 Eng Econ ..... 2	*CHEM 3340 Proc Anal ..... 3
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- 4410 Reaction Kinetics** **4:3:3**  
Chemical equilibrium. Analysis of experimental data to determine reaction rate parameters in homogeneous, heterogeneous, catalytic and non-catalytic reactions. Development of equations for batch, stirred-tank and tubular flow reactors. Application of differential equations to process and reactor design.  
*Prerequisite: MATH 3301, CHEN 3320 or concurrent, CHEN 3330 or concurrent, CHEM 3411 or concurrent.*
- 4420 Mass Transfer** **4:3:3**



To encourage and assist scholars in civil engineering, the Katherine E. and William C. Mundt endowment was established in 1983. In addition, the Tony Paine Memorial Scholarship was established in 1988, the David Bernsen Endowed Scholarship in 1997 and the Leslie A. Lakie Scholarship in 1999 and many others. These funds provide scholarships for qualified students. Application forms are available in the civil engineering department office.

## **Mission Statement**

Our mission is to provide quality education and meaningful career opportunities for both undergraduate and graduate students. We develop highly qualified graduates with potential to assume positions of increasing responsibility in Civil and Engineering. The Department will achieve its mission through continuous efforts to: (1) employ a faculty with the professional credentials and experience to deliver quality academic programs that meet student and societal needs; (2) serve a diverse student population by offering strong and varied academic programs that will prepare graduates for the challenges of life-long learning; (3) offer contemporary curricula that combine a foundation of general education and disciplinary preparation for the market place; and (4) provide both formal and informal learning resources to support instructional and scholarly/creative activities.

## **Vision Statement**

Lamar University's Department of Civil Engineering strives to become recognized as a regional/national/international leader in engineering education as well as in the analysis, design, and management of civil and environmental engineering systems. To support this endeavor, the department will seek to conduct, disseminate and apply relevant research to influence engineering practice and the advance of engineering education and knowledge. This will be accomplished through strategic efforts that allow the department to effectively adapt to the ever-changing aspects of higher education. The net effect will be that Lamar University's civil engineering graduates will be empowered with the knowledge, skills, and innovative thinking to facilitate discovery in numerous existing and yet to be discovered fields of endeavor.

## **Objectives**

The objectives of the Department of Civil Engineering at Lamar University are to provide a high quality engineering education in which graduates are prepared to:

- (1)

## Outcome Assessment

The Civil Engineering Department has developed an assessment process to demonstrate that the outcomes important to the objectives of its program are measured. This process is based on input from the department's various constituencies: alumni, employers, industrial practitioners, CE Advisory Council members, students and CE faculty. The process used in Program Educational Outcomes assessment for quality assurance includes:

- (1) choose outcomes for direct measurement,
- (2) identify performance criteria,
- (3) develop rubrics and standards for evaluation,
- (4) perform evaluation and direct measurement for 1 through 3,
- (5) college data from other outcome assessment instruments,
- (6) collectively assess for program outcome achievement using collected data, and
- (7) recommend implement improvement.

The Civil Engineering Department has used a mixed mode of assessment for program educational outcomes, which includes a) rubrics and dimensions in direct measurement; b) surveys for alumni, employers, industrial practitioners and graduating seniors for indirect measurement; and c) individual course assessment by instructor.

## Civil Engineering Program Outcomes

The following outcomes are achieved in one or more courses in the BSCE curriculum. Graduates will:

- (1) have an ability to apply knowledge of mathematics, science and engineering
- (2) have an ability to design and conduct experiments, analyze and interpret data
- (3) have an ability to design a system, components or process to meet desired needs
- (4) have an ability to function on multi-disciplinary teams
- (5) have an ability to identify, formulate and solve engineering problems
- (6) have an understanding of professional and ethical responsibility
- (7) have an ability to communicate effectively
- (8) have the broad education necessary to understand the impact of engineering solutions in a global and society context
- (9) recognize the need for and ability to engage in life-long learning
- (10) have a knowledge of contemporary civil engineering issues
- (11) have an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

## Bachelor of Science – Civil Engineering

### Additional Degree Requirements:

Candidates for degrees in this program are strongly encouraged to consider sitting for the National Council of Engineering Examiners Examination on "Fundamentals of Engineering" as administered by the Texas Board of Professional Engineers.

**Suggested Program of Study – Total Min. Hours: 133**

**First Year**

**Fall Semester**

ENGL 1301 Composition.....	3
MATH 2413 Calculus & Anal Geom I.....	4
CHEM 1411 Gen Chemistry.....	4
INEN 1101 Intro Engineering.....	1

**Spring Semester**

ENGL 1302 Composition or ENGL 1374 .....	3
MATH 2414 Calculus & Anal Geom II.....	4
COSC 1371 Intro to Microcomputers .....	3
P1uS373 491.544 m397 491.544 IS181 420.244 m205 420.2	

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- 4310 Building Design/Construction** **3:3:0**  
Advanced topics in Building and/or Construction Systems. Topics may include the treatment of contaminated soils, and the effects of various static, dynamic, hydraulic, and wind loads on structural frames and foundations. Environmental, social, and safety requirements may be taken under consideration. Presentation of oral and written design reports. May be repeated for credit when topics vary.  
*Prerequisite: Senior standing.*
- 4320 Engineering Project Management** **3:3:0**  
Principles governing the effective and efficient management of engineering projects including the application of comprehensive planning, scheduling, and cost estimation procedures. Presentation of oral and written design reports.  
*Prerequisite: Senior standing.*
- 4340 Foundation Engineering** **3:2:3**  
The practice of geotechnical engineering; subsurface explorations; geotechnical analysis and design of shallow footings, deep foundations, and retaining structures; stability of earth slopes, and soil improvement.  
*Prerequisite: CVEN 3390.*  
*Corequisite: CVEN 4380.*
- 4350 Hydraulic Engineering** **3:2:3**  
Continuation of CVEN 3350-Hydraulics I emphasizing practical design applications of basic fluid mechanics principles in fluid measurement, machinery, closed conduit flow, open channel flow and hydraulic transients. Presentation of oral and written design reports.  
*Prerequisite: CVEN 3350.*
- 4355 Advanced Environmental Engineering System** **3:3:0**  
Advanced topics in environmental engineering. Typical topics may include solid waste management, fundamentals and control strategy of air pollutants, advanced water and wastewater treatment, industrial waste treatment, hazardous waste management and research topics in environmental science and engineering. Maybe repeated for credit when topics vary.  
*Prerequisite: CVEN 3310, CVEN 3370*
- 4360 Hydraulic and Hydrological Modeling** **3:3:0**  
Advanced topics in hydraulic and hydrological models for water resource engineering system design and analysis. It may include models for watershed hydrological and floodplain hydraulic analysis, and also models for urban stormwater drainage system design and analysis. May be repeated for credit when subject matter varies.  
*Prerequisite: CVEN 3350*  
*Corequisite: 3360, 4350*
- 4370 Computer Aided Design** **3:3:0**  
Introduction of graphical computer-aided techniques to design various civil engineering systems. It may include introduction of AutoCAD and MicroStation, and also introduction of geographical information system (GIS - ArcView or Arc/Info) to analyze spatial data for feasibility study. May be repeated for credit when subject matter varies.  
*Prerequisite: Junior and Senior Standing*
- 4380 Reinforced Concrete Design** **3:2:3**  
The design of structural concrete members based upon working stress and strength design methods. Study of standard specifications. Introduction to pre-stressed concrete.  
*Prerequisite: CVEN 3340.*
- 4390 Structural Steel Design** **3:2:3**

# Phillip M. Drayer

## Program Outcomes of the Electrical Engineering Program

The educational outcomes that our students can expect to derive from the electrical engineering program are the following:

- *apply* knowledge of the physical sciences, mathematics, and engineering fundamentals to the solution of electrical engineering problems.
- *design* and *conduct experiments* in electrical engineering and analyze and interpret the data generated by those experiments.
- *design* components, devices, and systems to meet specific needs in electrical engineering.
- *work effectively* on multi-disciplinary teams involving people from diverse backgrounds.
- *identify and define problems* in electrical engineering and generate and evaluate solutions to those problems.
- *understand* the professional and ethical responsibilities incumbent upon the practicing electrical engineer.
- *communicate effectively*, both verbally and in writing.
- *understand* the role and impact of electrical engineering in a broader societal and global context.
- *recognize and respond* to the need for life-long learning for a successful career in electrical engineering.
- *develop an understanding* of contemporary technical and professional issues in the practice of electrical engineering.
- *use* the techniques, skills, and tools of modern engineering, including computer-based technologies such as programming, engineering and business applications, and the use of electronic media effectively in the practice of electrical engineering.-

Upon admission to the electrical engineering program, the student will be advised by the faculty of the department. Students are encouraged to seek out advice and counseling during any stage of their education. The faculty's greatest satisfaction is the success of its students.

Students entering the electrical engineering program must have a high school course in procedural and/or object-oriented programming. If not, 9 3Da1ah school course

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- 4101 Electrical Engineering Seminar I** **1:1:0**  
A study of the literature of electrical and related engineering fields; preparation and presentation of papers on electrical subjects.  
*Pre or Corequisite: ELEN 4206 or 4207.*
- 4102 Electrical Engineering Seminar II** **1:1:0**  
Preparation, presentation and discussion of material on the engineering profession, the interface between technology and society, and new areas of engineering involvement.  
*Pre or Corequisite: ELEN 4206 or 4207.*
- 4206 Senior Projects Design I** **2:1:5**  
Senior design projects with hardware implementation and testing. Preparation of project proposals, formal report and presentation. Two hours design content.  
*Prerequisite: ELEN 3313, 3322, 3441, 3381, 3431.*
- 4207 Senior Projects Design II** **2:1:5**  
Senior design projects with hardware implementation and testing. Preparation of project proposals, formal report and presentation. Two hours design content.  
*Prerequisite: ELEN 3313, 3322, 3441, 3381, 3431.*
- 4304 Advanced Topics** **3:3:0**  
Topics are selected on the basis of the needs of an adequate number of students. May be repeated for credit when topics vary. Topics include artificial neural networks, digital signal processing, advanced electromagnetics, fault tolerant design, fiber optics, advanced power systems, and VLSI (very large scale integrated circuit) design.  
*Prerequisite: ELEN 3312, 3322.*
- 4342 Electric Power Systems** **3:3:0**  
An introduction to electric power system analysis. Transmission line calculations, system operation, short circuit computations. One hour design content.  
*Prerequisite: ELEN 3441, 3371.*
- 4351 Control Engineering** **3:3:0**  
Transfer functions, stability criteria, time response, frequency response, root locus, design, and compensation. One hour design content.  
*Prerequisite: ELEN 3313.*
- 4361 Introduction to Communication Theory** **3:3:0**  
Principles of modulation, random signal theory and network analysis, basic information theory, analysis of noise. One hour design content.  
*Prerequisite: ELEN 3312, 3321*
- 4372 Electromagnetics II Topics** **3:3:0**  
Intermediate-level electromagnetics topics. May be repeated for credit when topics vary. Topics may include fiber optic wave guides and systems, communication antennas, microwave circuits and systems, radar theory and applications, etc. One and a half hours design content.  
*Prerequisite: ELEN 3371*
- 4381 Instrumentation** **3:3:0**  
Unified methods for the design of signal conditioning circuits between sensors and computers. Accepted practice for sensor based microprocessor and microcomputer data acquisition and processing systems. Instrumentation amplifier circuits. Two hours design content.  
*Prerequisite: ELEN 3321, 3431.*
- 4486 Microcomputer I** **4:3:2**  
Introduction to assembly language programming, microcomputer architecture, and operating systems. One and a half hours design content.  
*Prerequisite: ELEN 3431.*
- 4387 Microcomputer II** **3:2.5:1**  
Advanced assembly language, microcomputer organization, interfacing with peripheral devices and computer software development systems. One and a half hours design content.  
*Prerequisite: ELEN 4486.*

## Department of Industrial Engineering

The Bachelor of Science in Industrial Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

**Department Chair:** Victor Zaloom

**2014 Cherry Building, Phone 880-8804**

**Professors:** Zaloom, Chu

**Associate Professors:** Craig, Underdown

**Assistant Professor:** Curry, Liu, Marquez, Zhu

**Adjunct Faculty:** Kim

**Laboratory Technician:** Costa

**Administrative Associate:** Craigen

### Degrees Offered

The Department of Industrial Engineering offers Bachelor of Science degrees in Industrial Engineering and in Industrial Technology.

### Industrial Engineering

Industrial engineering serves vital functions in today's world and provides a wide range of career opportunities. It is particularly well positioned to develop individuals who provide solutions for the fields of supply chain management, logistics, operations research, project management, six sigma, economic analysis and associated solutions, quality assurance management, plant operation control/design and managerial problem solving that require a knowledge of fundamental science and engineering practices including human-system interaction.

Industrial engineering deals not only with technology but also with people. It especially deals with managerial problems requiring knowledge of fundamental science and engineering practice for their solutions. The Department of Industrial Engineering at Lamar University is one of the leaders in integrating computer applications including computer integrated manufacturing, simulation, lean manufacturing and micro-meso machining into the curriculum.

Industrial engineers combine advanced study in management systems, economics and decision-making to answer such questions as: "What products or services should we offer? What materials and methods should we use? How can we best motivate and reward people? How can we improve quality, productivity, service, and employee safety?"

Typical responsibilities of the industrial engineer involve design, operation and management. While manufacturing industry demands many graduates, increasing numbers are finding satisfying employment in other kinds of businesses. Airlines, banks, restaurant chains, department stores, hospitals, and governmental agencies.

An advisory committee of successful alumni from industry supports the department's

## Mission Statement

Our mission is to provide quality education and meaningful career opportunities for both undergraduate and graduate students. We develop highly qualified graduates with potential to assume positions of increasing responsibility.

Our mission will be accomplished by recruiting and educating qualified students in an accredited curriculum of academic course work and experiences. Demand for graduates will be driven by frequent contact with employers through initiatives such as advisory council meetings, continuing education, co-op programs, consultation, research/development, publications, and student projects.

## Our Vision

Our vision is to be the “Preferred Provider of Industrial Engineering Graduates and Technology.” We will accomplish our vision by: (1) recruiting quality students, (2) developing employer-focused relationships (3) increasing supporting resources, and (4) integrating academic course work and industrial engineering experiences.

## Industrial Engineering Department Goals

1. Recruit high-quality industrial engineering students
2. Prepare students with skills to compete through course work in an accredited program
3. Enhance students’ career opportunities through frequent employer contacts and work experiences
4. Encourage students to develop leadership skills
5. Encourage students to pursue life-long learning
6. Develop relationships with employers of industrial engineering skills
7. Increase department resources through growth in enrollment, development, and funded projects
8. Conduct applied research and publish results with the ultimate goal of technology transfer for the betterment of mankind
9. Provide exemplary service for the benefit of the University, the Beaumont metropolitan community, the State of Texas, local and global business and industrial organizations, and the engineering profession

## Industrial Engineering Program Objectives

Graduates of the BSIE program are expected to be able to practice the following:

1. Graduates will possess the ability to design, redesign, develop, implement and improve complex integrated systems with an appreciation of professional and ethical responsibility.
2. Graduates will have the ability to apply the principles and techniques of traditional and modern quantitative and qualitative analysis and synthesis and effectively interpret, evaluate, select and communicate the desired alternative in both manufacturing and service industries.
3. Graduates will possess the required industrial engineering competence and the ability to recognize the need for life-long learning to understand the impact of engineering solutions on society at all levels of an organization.

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### Third Year

INEN 3322 Engr. Matls. & Procs.....	3	INEN 4316 Industrial and Product Safety .....	3
INEN 4315 Industrial Management .....	3	INEN 4345 Computer Int. Manufacturing.....	3
INEN 4350 Production & Inventory Control .....	3	INEN 4370 Operations Research .....	3
INEN 4300 Quality Improvement.....	3	CHEM 1412 - Lab Science Elective (1) .....	4
ECON 1301 Social Science Elective (2).....	3	HIST (1301-2377) History II.....	3
HIST 1301-1377 History I.....	3		
	18		16

### Fourth Year

ENGL 2322-2377 English Literature .....	3	INEN 4385 IE Design.....	3
INEN 4312 IE Systems Design .....	3	INEN/TECH Elective (3).....	3
INEN 4375 Simulation of IE Sys.....	3	INEN/TECH Elective (3).....	3
INEN/TECH Elective (3).....	3	Fine Arts Elective (6).....	3
POLS 2301 American Gov't. I.....	3	POLS 2302 American Gov't. II.....	3
COMM 1315, 1360, 2335, 2373, 3310, 3340 (4) .	3		
	18		15

#### Notes:

- (1) CHEM 1412 or another course approved by the INEN advisor.
- (2) Social science electives are ECON 1301, PSYC 2301, SOCI 1301, ANTH 2346 or (ECON 2301 and ECON 2302).
- (3) A 3000- or 4000-level INEN course approved by INEN advisor.
- (4) COMM 1315, 1360, 2335, 2373, 3310, 3340, or Modern Language including DSDE 2375 American Sign Language.
- (5) Any course in Sophomore Literature (ENGL 2322-2377) will satisfy this requirement.
- (6) Fine arts electives are: ARTS 1301, DANC 2304, HUMA 1315, MUSI 1306 or THEA 1310.

## Bachelor of Science/MBA (five-year program)

Industrial Engineering undergraduates are eligible to participate in a five-year academic program that leads to two degrees: a Bachelor of Science in Industrial Engineering and Masters of Business Administration (MBA).

Industrial Engineering students will complete all of the normal Bachelor of Science in Industrial Engineering degree requirements and the Industrial Engineering electives are replaced with MBA leveling courses. Economics is taken as the social science.

Special scholarships are available to qualified high school graduates. An expedited MBA admission process is also available to Bachelor of Science in Industrial Engineering seniors who meet requirements.

## Industrial Technology

The Department of Industrial Engineering offers a Bachelor of Science degree in Industrial Technology (BSIT). Lamar University's Industrial Technology program prepares students for positions in industrial management. The BSIT allows students to transfer up to 40 hours of technical coursework. The BSIT provides students with the credentials for promotion within their technical field or for a career in Industrial Technology.

Students will learn how to streamline processes, improve quality, ensure safety in the workplace, and manage production and inventory systems and technical personnel. Industrial Technology students typically gain employment with companies that manufacture a product. Daily activities might include solving problems in production, improving quality of products and processes and managing technical personnel.

The first two years of this program are composed primarily of technical courses commonly taken at two-year schools such as the Lamar Institute of Technology, Lamar State College at Orange or Lamar State College at Port Arthur. Students are also accepted from other technical two-year programs throughout the state and nation.

Admission to the Industrial Technology program will be granted upon application, after completion of a minimum of 40 semester hours toward the Associate of Applied Science degree or Engineering common program with a grade point average of at least 2.00. Students in a two-year applied science program who intend to continue their education in the Industrial Technology program should make an appointment for advisement very early in their coursework. Early advisement for the BSIT will ensure







- 4363\* Six Sigma** **3:3:0**  
Overview of the six sigma DMAIC methodology at the green belt level of competency with emphasis on process management.  
*Prerequisite: INEN 3380*
- 4369 Engineering Management** **3:3:0**  
Transition from engineering to management decision-making responsibilities. Topics include: leadership, proposal writing, negotiation, process/project management, and technology management.  
*Prerequisite: Senior standing*
- 4370 Operations Research** **3:3:0**  
An introduction to the construction and mathematical models of organizational systems to aid executives in making decisions.  
*Prerequisite: MATH 2318*
- 4374 Human Factors Engineering** **3:3:0**  
Convey human linear programming and stochastic models with a focus on formulation and solution procedure.  
*Prerequisite: INEN 3380*
- 4375 Simulation of I.E. Systems** **3:3:0**  
Introduction to concepts of simulation modeling and analysis with application to manufacturing and service systems. Students will apply problem solving and process analysis techniques to an industrial engineering problem and propose an improved systems design.  
*Prerequisite: INEN 4320*
- 4376 and propose an improved systems design.**

**4396 Automated Systems Engineering****3:3:0**

To provide students in engineering with knowledge about the industrial automation and process control in the manufacturing industry: control system, PLC, sensor and actuator, auto-id, flexible manufacturing system, assembly line and automatic inspection

*Prerequisite: Senior with good standing or Graduate students, or permission of instructor*

*\* Pending approval by the Texas Higher Education Coordinating Board*

## Department of Mechanical Engineering

Program accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology.

**Department Chair:** Hsing-wei Chu

**2008 Cherry Building, Phone 880-8769**

**Professors:** Chu Corder, Srinivasan

**Associate Professor:** Aung, Fan

**Assistant Professor:** Li, Zhou

**Laboratory Technician:** Day

**Administrative Associate:** Venable

### Mission Statement

The mission of the Department of Mechanical Engineering at Lamar University is to provide high-quality educational and meaningful career opportunities for its graduates, so they may assume professional positions of increasing responsibility. Recruiting and educating students in an accredited curriculum of course work and experiences reflects the department's mission. Demand for graduates of the department will be enhanced by frequent contact with potential employers through initiatives such as co-op programs, consultations, research and development, and student projects. Frequent program assessment ensures that students' and employers' needs drive the continual refinement of curricula and departmental objectives.

### Vision

The vision of the mechanical engineering department at Lamar University is to be a leader in training students for the mechanical engineering profession. The mechanical engineer may be perceived as one who is engaged in a diverse profession encompassing the analysis, design, synthesis and material optimization for a wide variety of mechanical and thermal systems. The mechanical engineer must work closely with other engineering disciplines to provide tools and equipment components to enable them to practice their professions. In order to cover this wide range of requirements, the mechanical engineer needs a solid foundation in basic sciences, mathematical sciences and engineering.

### Mechanical Engineering Program Educational Objectives

As defined by American Society of Mechanical Engineers (ASME) International, mechanical engineers are men and women who design, develop and manufacture machines that produce, transmit or use power. There is hardly an area in modern life that has not been influenced by a mechanical engineer at some point along the path from invention to installation. Mechanical engineering knowledge is essential to build automobiles, airplanes, ships, satellites and health care equipment, to name a few.



(p) a knowledge of manufacturing, maintenance and inspections for engineering systems; and

(q) an ability to function on multi-disciplinary teams.

Rubrics for quantitative measurement of attainment of these program outcomes were developed and used for outcome assessments. Based on the results of the outcome assessments, continuous program improvements are being implemented.

## Bachelor of Science – Mechanical Engineering

### Suggested Program of Study – Total Min. Hours: 138

#### First Year

##### Fall Semester

ENGL 1301 Composition I ..... 3  
 MATH 2413 Calculus & Anal Geom I ..... 4  
 CHEM 1411 Gen Chemistry ..... 4

##### Spring Semester

ENGL 1302/1374 Composition ..... 3  
 MATH 2414 Calculus & Anal Geom II ..... 4  
 ELEN 1301 Intro to Computers

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## Mechanical Engineering Courses (MEEN)

- 2302 Dynamics** **3:3:0**  
Kinematics of rigid bodies, kinetics of rigid bodies, work and energy, impulse and momentum.  
*Prerequisite: CVEN 2301 or equivalent, MATH 2414 or concurrent.*
- 2374\* Thermodynamics I** **3:3:0**  
The properties of a pure substance and equations of state: The first law and second law of thermodynamics and their application in analysis of thermal process. Basic concepts of thermodynamic cycles and thermal efficiency.  
*Prerequisite: PHYS 2425, MATH 2415.*
- 3210 Measurements Laboratory** **2:1:3**  
Theory and application of measurements with various instruments are treated. Topics include technical report writing, statistics, and data acquisition. Experiments involving pressure, temperature, speed, power, torque, fre-

4313





***All five undergraduate curricula in engineering—chemical, civil, electrical, industrial and mechanical—are accredited by the Engineering Accreditation Board for Engineering and Technology.***

