

Department of Engineering and Computer Science

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The Department of Engineering and Computer Science offers programs in computer science, engineering technology, pre-engineering, and mechanical engineering. The department is committed to the University mission, specifically committed to the concept of a student-focused teaching and learning environment. All programs are actively engaged in research, outreach and support of regional industries. The department faculty is a diverse, talented group with expertise in a broad range of experimental and analytical areas.

Students may pursue undergraduate bachelor of science degrees in computer science, engineering technology and mechanical engineering. Students in all areas have ample opportunities for internships and student research.

Computer Science

The computer science curriculum is designed to provide the student with significant exposure to theory, abstraction and design components of the field of computer science.

Engineering Technology

The engineering technology curriculum combines an emphasis on understanding engineering and technical fundamentals with real-life applications in manufacturing and industry.

Two options are available within the Engineering Technology Degree Program.

- The first option prepares the students for careers in industry and manufacturing.
- The second option contains much of the same technical background but adds emphasis in management and marketing, thus preparing students for careers in industrial management and sales.

Engineering technology majors can participate in a Cooperative Education Program that combines classroom study with a planned program of related work experience with industry or government agencies in the Texas Panhandle area. Students also may participate in industrial internships arranged through the Engineering Technology Internship Program.

Mechanical Engineering

The program is accredited by ABET. The Mechanical Engineering Program prepares students for careers involving design and development of thermal, fluid and mechanical systems. This curriculum provides the mathematics, science, engineering and

design background as necessary preparation for the practice of engineering.

Pre-Engineering Program

The Pre-Engineering Program prepares students for a thorough grounding in mathematics, physics and chemistry, universally required by all ABET-accredited engineering programs. Completion of the Pre-Engineering Program will prepare students to enter WTAMU's Mechanical Engineering Program or transfer to another four-year university to complete their degree in other engineering disciplines.

Discipline	Course Prefix
Computer Science	CS
Engineering	ENGR
Engineering Technology	ET
Mechanical Engineering	MENG

NOTE: See the "Academic Courses and Abbreviations" and "Course Descriptions" sections of this catalog for a complete list of courses offered by the University.

Department of Engineering and Computer Science

Bachelor of Science (B.S.) Degree

Major in Computer Science (Major Code: 307)

The computer science curriculum is designed to provide the student with significant exposure to the theory, abstraction and design components of the field of computer science.

Program Outcomes

Students completing this curriculum will be able to demonstrate:

1. A system-level perspective;
2. An appreciation of the interplay between theory and practice;
3. Familiarity with common themes of computer science such as abstraction, complexity and evolutionary change; and
4. Adaptability to the enormous pace of change in computing.

Students will have significant project experience.

A student must complete a minimum of 122 semester credit hours to include at least 36 advanced hours.

University Core Curriculum Requirements

Refer to the "University Core Curriculum" section of this catalog.

Core curriculum elections for computer science majors:

- CHEM 1411, 1412 or PHYS 2425, 2426 from natural sciences.
- MATH 2413 from mathematics.

Computer Science Requirements*

- CS 1301, 1437, 2425, 2436, 2377, 3307, 3310, 3315, 3352, 3372, 4310, 4325, 4385, 4390, 4391 .
- ENGR 1302.
- MATH 2321, 2322 and 2414.
- Six hours advanced MATH chosen from 3311, 3321, 3340, 3342, 3343, 4310, 4340, 4341, 4361, and 4362.
- Six hours advanced CIS/CS electives chosen from CS 3303, 3387, 4097, 4098, 4330, 4350, 4360, 4392 and CIS 3350, 3372, 4350, 4372, 4382. MUST have advisor approval for selection.
- Six hours electives from ENGR, ET, PHYS or MATH.

*Students must earn a grade of "C" or better in all CS and CIS courses. A course for which the grade is "D" or lower must be repeated.

Admission Requirements for Computer Science

All computer science students must meet West Texas A&M University admission requirements. Upon admission to the University, all WTAMU students would be eligible to engage in and complete the first two years of the Computer Science Program.

Minor in Computer Science

The minor in computer science is available to any student pursuing a B.S. degree. Requirements for a minor are specified elsewhere in the catalog.

Curriculum Guide (suggested course sequence)			
Major in Computer Science Bachelor of Science Degree			
First Year		Second Year	
Semester 1	Semester 2	Semester 1	Semester 2
CS 13013 hrs. ENGL 13013 hrs. HIST 13013 hrs. SCOM 1315 or 13213 hrs. Social and Behavioral Science 3 hrs. 15 hrs.	CS 14374 hrs. ENGL 13023 hrs. ENGR 13023 hrs. HIST 13023 hrs. MATH 24134 hrs. 17 hrs.	CS 24364 hrs. MATH 23213 hrs. PHED 11111 hr. CHEM 1411 or PHYS 24254 hrs. MATH 24144 hrs. 16 hrs.	CS 24254 hrs. CS 23773 hrs. MATH 23223 hrs. CHEM 1412 or PHYS 24264 hrs. Visual and Performing Arts3 hrs. 17 hrs.
Third Year		Fourth Year	
Semester 1	Semester 2	Semester 1	Semester 2
CS 33073 hrs. CS 33103 hrs. CS 33523 hrs. Adv. MATH3 hrs. POSC 2305 3 hrs. 15 hrs.	CS 33153 hrs. CS 33723 hrs. Humanities3 hrs. CS/CIS elective3 hrs. POSC 2306 3 hrs. 15 hrs.	CS 43103 hrs. CS 43253 hrs. CS 43903 hrs. Adv. MATH3 hrs. Elective 3 hrs. 15 hrs.	CS/CIS elective3 hrs. CS 43853 hrs. CS 43913 hrs. Elective 3 hrs. 12 hrs.

Department of Engineering and Computer Science

Major in Engineering Technology (Major Code: 112)

A student must complete a minimum of 122 semester credit hours to include at least 36 advanced hours.

University Core Curriculum Requirements

Refer to the “University Core Curriculum” section of this catalog. Students must take PHYS 1401 and 1402 (or PHYS 2425 and 2426), and MATH 1314 (Option I) or 1324 (Option II).

Option I—Industrial/Manufacturing

- ENGR 1301, 1304, 1375, 2301, 2302.
- ET 2371, 2372, 2375, 3301, 3360, 4314, 4370, 4380 and four courses from 3315, 3330, 4301, 4311, 4325, 4330.
- CHEM 1411, 1412; ENGL 2311; MATH 1316 or 2412; MATH 2413.
- Select four courses from upper-level ET electives (or math, CS, management, ENGR, MENG or other courses after consulting with an adviser).
- Additional hours to meet the minimum University requirement for a degree.

Option II—Distribution

- ENGR 1301, 1304, 1375.
- ET 2371, 2372, 3301, 3360, 4311, 4314, 4340, 4370, 4380 and four courses from 3315, 3330, 4301, 4325, 4330.
- CHEM 1411, 1412; ENGL 2311; MATH 1325.
- Select four courses from MGT 3330, 3332, 3335, 4311, 4330, MKT 3340, 3342, 3350, 4340, 4346.
- Additional hours to meet the minimum University requirement for a degree.

Teacher Certification

Consult the “Department of Education” section of this catalog for general education and certification major requirements related to programs offered by this department.

For information about the master of science (M.S.) degree in engineering technology, refer to the “Graduate School” section of this catalog.

Curriculum Guide (suggested course sequence)			
Major in Engineering Technology Option I—Industrial Manufacturing			
First Year		Second Year	
Semester 1	Semester 2	Semester 1	Semester 2
ENGL 13013 hrs. MATH 1314 or 13243 hrs. ENGR 13753 hrs. ENGR 13043 hrs. Social/Behavioral core3 hrs. 15 hrs.	ENGL 13023 hrs. MATH 1316 or 24123-4 hrs. ENGR 13013 hrs. CHEM 14114 hrs. Visual/Performing arts3 hrs. 16-17 hrs.	MATH 24134 hrs. SCOM 1315, 1318 or 1321 ...3 hrs. ET 23713 hrs. Social/Behavioral core3 hrs. CHEM 1412 ...4 hrs. 17 hrs.	ET 23753 hrs. ENGL 23113 hrs. ET 23723 hrs. PHYS 14014 hrs. PHED 11111 hr. 14 hrs.
Third Year		Fourth Year	
Semester 1	Semester 2	Semester 1	Semester 2
ET 33603 hrs. PHYS 14024 hrs. Specialization** ...3 hrs. ENGR 23013 hrs. Social/Behavioral core3 hrs. 16 hrs.	ET 33013 hrs. ET*3 hrs. Specialization** ...3 hrs. ENGR 23023 hrs. Humanities core3 hrs. 15 hrs.	ET 43143 hrs. ET*3 hrs. ET*3 hrs. Specialization** ...3 hrs. Social/Behavioral core3 hrs. 15 hrs.	ET 43703 hrs. ET 43803 hrs. ET*3 hrs. Specialization** ...3 hrs. Social/Behavioral core3 hrs. 15 hrs.
*Choose four courses: ET 3315, 3330, 4301, 4311, 4325, 4330. **Choose four courses: ET, MATH, CIS, MGT advanced elective by advisement.			

Curriculum Guide (suggested course sequence)			
Major in Engineering Technology Option II—Distribution			
First Year		Second Year	
Semester 1	Semester 2	Semester 1	Semester 2
ENGL 13013 hrs. MATH 13243 hrs. ENGR 13753 hrs. Social/Behavioral core6 hrs. 15 hrs.	ENGL 13023 hrs. MATH 13253 hrs. ENGR 13013 hrs. ENGR 13043 hrs. CHEM 1411 ...4 hrs. 16 hrs.	Social/Behavioral core3 hrs. SCOM 1315, 1318 or 1321 ...3 hrs. ENGL 23113 hrs. ET 23713 hrs. CHEM 1412 ...4 hrs. 16 hrs.	Social/Behavioral core3 hrs. Visual/Performing arts core3 hrs. ET 23723 hrs. ET 33013 hrs. PHYS 14014 hrs. PHED 11111 hr. 17 hrs.
Third Year		Fourth Year	
Semester 1	Semester 2	Semester 1	Semester 2
ET 33603 hrs. ET*3 hrs. MGT/MKT**3 hrs. PHYS 14024 hrs. 13 hrs.	ET 43113 hrs. ET*3 hrs. MGT/MKT**3 hrs. Humanities core3 hrs. Elective3 hrs. 15 hrs.	ET 43143 hrs. ET 43403 hrs. ET*3 hrs. MGT/MKT**3 hrs. Elective3 hrs. 15 hrs.	ET 43703 hrs. ET 43803 hrs. ET*3 hrs. MGT/MKT**3 hrs. Social/Behavioral core3 hrs. 15 hrs.
*Choose four courses—ET 3315, 3330, 4301, 4325, 4330. **Choose four courses—MGT 3330, 3332, 3335, 4311, 4330, MKT 3340, 3342, 3350, 4340, 4346.			

Department of Engineering and Computer Science

Major in Mechanical Engineering (Major Code: 129)

A student must complete a minimum of 126 semester credit hours to include at least 36 advanced hours.

University Core Curriculum Requirements

Refer to the “University Core Curriculum” section of this catalog. Students must take MATH 2413 (Calculus I) from mathematics and PHYS 2425, 2426 (Engineering Physics I and II) from natural sciences.

Mechanical Engineering Requirements

- ENGR 1301, 1302, 1304, 1375, 2301, 2302, 3302; MENG 3320, 3340, 3350, 3360, 4304, 4350, 4352, 4360, 4362, 4380.
- CHEM 1411, ET 2371 or 2372, MATH 2414, 3340, 3342, 4361.
- Two MENG electives (6 SCH). One upper-level MATH/PHYS elective (3 SCH). One elective in ENGR, ET or MENG (3 SCH).

Program Outcomes

Faculty members use the program educational outcomes to develop the topics covered and assignments in each course. By the time of graduation, mechanical engineering students will be able to:

- Apply science, mathematics, and modern engineering tools and techniques to identify, formulate and solve engineering problems.
- Design thermal/fluid, mechanical, and electro-mechanical components or systems, individually or on interdisciplinary teams, and effectively communicate those designs in both technical and non-technical forums.
- Collect, analyze and interpret data from prescribed and self-designed experimental procedures and formally communicate the results.
- Apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic and social issues.
- Recognize that ethical behavior and continuous acquisition of knowledge are fundamental attributes of successful mechanical engineering professionals.
- Pass the Fundamentals of Engineering examination.

Admission Requirements for Pre-Engineering and Mechanical Engineering

All mechanical engineering students must meet West Texas A&M University’s admission standards as outline in this catalog. Upon admission to the University, all WTAMU students would be eligible to engage in and complete the first two years of the

Engineering Program. In the semester during which the student would complete the pre-engineering sequence (cited below), the student may petition for admittance into the Mechanical Engineering Program. Every student enrolled in mechanical engineering courses must first be admitted into the Mechanical Engineering Program or receive special permission from the department head.

Criteria for admission into the Mechanical Engineering Program:

- Overall GPA of at least 2.25.
- Completion of the pre-engineering sequence—MATH 2413, 2414, PHYS 2425, 2426, ENGR 1301, 1302, 2301, 2302, with a GPA of at least 2.75.
- Successfully complete the entrance interview with adviser.

Students pursuing a mechanical engineering degree who do not meet the aforementioned criteria are to be listed as pre-engineering (Major Code 128) students.

Students may appeal the Engineering Admissions Committee decisions, first to the committee and then to the Engineering Program coordinator. Exceptions, resulting in conditional admission, will be considered on an individual basis by the program coordinator.

Curriculum Guide (suggested course sequence)			
Major in Mechanical Engineering Bachelor of Science Degree			
First Year		Second Year	
Semester 1	Semester 2	Semester 1	Semester 2
ENGR 13013 hrs. ENGR 13043 hrs. CHEM 14114 hrs. MATH 24134 hrs. ENGL 13013 hr. 17 hrs.	ENGR 13023 hrs. ENGR 13753 hrs. MATH 24144 hrs. PHYS 24254 hrs. ENGL 13023 hrs. 17 hrs.	ENGR 23013 hrs. MATH 33423 hrs. PHYS 24264 hrs. ET 23713 hrs. SCOM 13153 hrs. 16 hrs.	ENGR 23023 hrs. MATH 33403 hrs. MENG 33403 hrs. Humanities core3 hrs. Visual/Performing arts core3 hrs. PHED 11111 hr. 16 hrs.
Third Year		Fourth Year	
Semester 1	Semester 2	Semester 1	Semester 2
MENG 43043 hrs. MENG 33203 hrs. ENGR 33023 hrs. MENG 33503 hrs. HIST 13013 hrs. 15 hrs.	MENG 33603 hrs. MENG 43603 hrs. MENG 43503 hrs. MATH 43613 hrs. HIST 13023 hrs. 15 hrs.	MENG 43523 hrs. MENG 43623 hrs. Math/physical science elective* ..3 hrs. POSC 23053 hrs. Elective**3 hrs. 15 hrs.	MENG 43803 hrs. MENG elective ..3 hrs. MENG elective ..3 hrs. POSC 23063 hrs. Social/Behavioral core3 hrs. 15 hrs.
*Must be upper-level. **Choose from ENGR, ET or MENG.			