Texas A&M University -- College of Engineering -- Department of Computer Science & Engineering
Undergraduate Degree Plan in **Computer Engineering** (CECN)
Valid for Catalog 136 (2013-2014)

Student ID No. | Student name | Date

Student's local address | Local phone number

Student's permanent address | Permanent phone

COMPUTER SCIENCE [1]

CSCE	113	(2)
	221	(4)
	222	(3)
	313	(4)
	315	(3)
	350	(4)
	462	(3)
	481	(1)
	483	(3)

ELECTRICAL ENGR

ECEN	214	(4)
	248	(4)
	314	(3)
	325	(4)
	454	(3)

ENGINEERING

ENGR	111	(2) [3]
	112	(2) [3]

ENGR ELECTIVE

_____ (3) [7]

AREA ELECTIVE (open)

_____ (3)

MATH & STAT [1]

MATH	151	(4) [3]
	152	(4) [3]
	251	(3)
	308	(3)
	311	(3)
STAT	211	(3)

SCIENCES

CHEM	107	(3) [3]
	117	(1) [3]
PHYS	218	(4) [3]
	208	(4) [3]

ENGLISH

ENGL	104	(3) [3]
ENGL	210	(3)

241 *or* 301 *or*
COMM 205 *or* 243

AREA ELECTIVES (tracks)

Track 1: _____
_____ (3)
_____ (3)

Track 2: _____
_____ (3)
_____ (3)

HUMANITIES

ENGR/ PHIL 482 (3) [6]

VISUAL & PERFORMING ARTS ELECTIVE

_____ (3)

SOCIAL SCIENCE ELECTIVE

_____ (3)

INTERNATIONAL AND CULTURAL DIVERSITY

_____ (3) [4]
_____ (3) [4]

PHYSICAL EDUCATION

KINE	198	(1) [5]
KINE	199	(1) [5]

CITIZENSHIP

HIST	_____	(3)
HIST	_____	(3)
POLS	206	(3)
POLS	207	(3)

TOTAL HOURS 128

NOTES:

1. Courses inside box must be completed with grade of C or better
2. CSCE 481 should be taken in the student's Junior year
3. Grade average for CBK courses must be 2.75 or higher for upper level
4. Courses taken for diversity credit may be courses taken to meet another requirement
5. KINE 199 must be taken S/U. KINE 198 may be taken S/U.
6. Writing intensive section of ENGR 482 required; transfer courses must be approved.
7. Engineering elective list available with degree plans, on our website, and from the advising office.

Student's signature and date | Undergraduate advisor approval

4/26/13

Computer Engineering Area electives

- Students are required to satisfy 2 depth tracks. Satisfying a track requires completing at least 2 courses from the track's list (see below). Consequently, four of the area elective electives are occupied by depth requirements.
- #A few courses are in multiple tracks—each course can only be used in **one** place on your degree plan. You cannot use the course in two places.
- The fifth course can be from the sequence list or any **approved** 300/400 level course in CSCE or ECEN. Consult your advising office to determine if a course is approved.
- Depth tracks are subject to change. Consult your advising office for the current list.

Depth Tracks

- Communications and Networks
  - CSCE 463 (3), Computer Networks
  - CSCE 464 (3), Wireless and Mobile Systems
  - #CSCE 465 (3), Computer and Network Security
  - #ECEN 455 (4), Digital Communications
  - ECEN 478 (3), Wireless Communications
  - MATH 470 (3), Comm. & Cryptography
- VLSI
  - ECEN 468 (4), Advanced Logic Design
  - ECEN 474 (4), VLSI Circuit Design
  - ECEN 475 (4), Intro. to VLSI Sys. Design
  - ECEN 326 (4), Electronic Circuits
- Software Systems
  - CSCE 314 (3), Programming Languages
  - CSCE 410 (3), Advanced OS
  - CSCE 411 (3), Design and Analysis of Algorithms
  - CSCE 431 (3), Software Engineering
  - CSCE 434 (3), Compiler Design
  - CSCE 435 (3), Parallel Computing
  - CSCE 442 (3), Scientific Programming
  - #CSCE 465 (3), Computer and Network Security
- Signal/Image Processing & Graphics
  - CSCE 441 (3), Computer Graphics
  - CSCE 443 (3), Game Development
  - ECEN 444 (3), Digital Signal Processing
  - ECEN 447 (4), Digital Image Processing
  - ECEN 448 (3), Real time DSP
- Robotics/Embedded Systems
  - CSCE 420 (3), Artificial Intelligence
  - CSCE 452 (3), Robotics
  - CSCE 456 (4), Real-time Computing
  - ECEN 420 (3), Linear Control systems
  - ECEN 421 (3), Digital Control Systems
- Information
  - CSCE 310 (3), Database systems
  - CSCE 436 (3), Computer Human Interaction
  - CSCE 444 (3), Structures of Interactive Info.
  - CSCE 470 (3), Information Storage & Retrieval
  - CSCE 438 (3), Distributed Objects
  - #ECEN 455 (3), Digital Communications

Computer Engineering
Engineering Electives, Fall 2008 catalog and later (catalogs 131 and later)

The following courses have been approved for use in the Computing Engineering major as Engineering Electives:

- AERO 320, Numerical Methods (3). ***Not permitted if CSCE 442 also is on the degree plan.*** Prerequisites: AERO 220; MATH 308 or registration therein.
- BIOL 113, Essentials in Biology (3). No prerequisites listed.
- MEEN 221, Statics and Particle Dynamics (3). Prerequisites: admission to upper division in an engineering major; MATH 251 or 253 or registration therein; PHYS 218.
- MEEN 222, Materials Science (3). Prerequisites: CHEM 102, or 104 and 114, or CHEM 107/117; PHYS 218.
- MEEN 315, Principles of Thermodynamics (3). Prerequisites: MEEN 221; MATH 251 or 253.
- MATH 414, Fourier Series and Wavelets (3). Prerequisites: MATH 304, 311 or 325.
- MATH 442 (3), Mathematical Modeling (3). Prerequisites: MATH 304 and 308 or equivalents.
- MATH 471, Communications and Cryptography II (3). Prerequisites: MATH 470 or consent of instructor.
- PHYS 221, Optics and Thermal Physics (3). Prerequisites: PHYS 208 or 219; MATH 152 or 172; registration in MATH 221; 308.
- PHYS 222, Modern Physics for Engineers (3). Prerequisites: PHYS 208 or 219; MATH 308 or registration therein.

Prerequisites are as listed in the Fall 2010 catalog.

COMPUTER ENGINEERING UNDERGRADUATE PROGRAM
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
TEXAS A&M UNIVERSITY

CURRICULUM. The curriculum in computer engineering is designed to prepare students to enter into the rapidly expanding computer field. It is based upon the IEEE Computer Society and Association for Computing Machinery recommendations for curricula and courses. A major in computer engineering at Texas A&M University includes specific courses in Electrical Engineering. Students can also complete a minor in Mathematics by taking one additional course. Students can complete minors in several other disciplines.

The four-year undergraduate curriculum in computer engineering includes a sound preparation in science, mathematics, English, statistics and computing. Students select three senior electives from twelve courses. The most popular are offered in multiple sections and semesters. Elective courses are available in the areas of: languages and compilers; software systems; computer systems and architecture; artificial intelligence and cognitive modeling; graphics and robotics; and computational science and engineering. Graduate courses in these areas may be taken by advanced undergraduates.

FACILITIES. The Department of Computer Science and Engineering has significant computer resources of its own, shares resources with other departments, and makes use of University systems. The department has 180 workstations available to students around the clock in instructional and open access laboratories and maintains numerous servers that are available to our students. All students have access to several web servers and the department's multiprocessor computational servers. These include three multiprocessor Sun servers running Solaris and a multiprocessor Linux server running Red Hat Enterprise. In addition, each student is allocated storage on the department's 10 TB file server. Wireless network access is provided throughout the department as is remote access via VPN.

UNIVERSITY AND AREA. Texas A&M University is located in the Bryan/College Station area (population estimated in 2010 to be 211,096; located 100 miles north of Houston). The Bryan/College Station area has been recognized as one of the leading growth areas in the nation. A growing industrial base, excellent housing, strong public school systems, and many recreational and entertainment activities characterize the area.

Texas A&M University, a land-grant, sea-grant, and space-grant university, was established in 1876 as the state's first public institution of higher education. The campus covers 5,142 acres and is within easy driving distance of the four largest cities in Texas. Enrollment is more than 48,000 students, and Texas A&M University has one of the largest enrollments in the nation in engineering, veterinary medicine as well as architecture and environmental design.

FINANCIAL AID. Presently, the Computer Science and Engineering Department's scholarship funds are limited to returning undergraduates. The main application deadlines are in the Spring semester, although other opportunities may be announced. Additionally, there are many sources of support through the TAMU Financial Aid Office for students enrolled in Texas A&M University. Furthermore, university research projects often require the assistance of programmers, and many Computer Engineering students are hired to fill these jobs. The Computer Services Center hires some students as student operators, programmers, and analysts. Texas A&M University also has an active Co-operative Education Program with many openings for Computer Engineering students.

DEGREE PLAN INSTRUCTIONS FOR COMPUTER ENGINEERING MAJORS (CS TRACK)

2013-2014 Academic year

The instructions contained in this packet are to be used as a guide in preparing the Departmental of Computer Science and Engineering (CSCE) Degree Plan Form for the Bachelor's Degree in Computer Engineering (CECN). After the student completes filling out the degree plan form (available from the Web Page http://www.cse.tamu.edu/academics/undergraduate), it is to be submitted to the Computer Engineering Undergraduate Advisor for approval. When the degree plan is approved by the Undergraduate Advisor, it will be returned to the student via an email message and a copy will placed in the student's file in the CSCE Advising Office.

CSCE courses at 300 level and above and ECEN courses at 200 level and above are designated as upper level courses. Students are admitted into lower division (CECL). After successful completion of the CBK classes, advancement to upper division (CECN) needs to be approved by the undergraduate advisor prior to enrollment in upper division CSCE courses. **Students enrolling in upper division CSCE or ECEN courses without CPSC/CECN designation will be removed from the courses.**

Degree audits are produced by the Registrar's Office and can be viewed on-line at howdy.tamu.edu once the student reaches upper level. The audit should be carefully reviewed by the student with his/her advisor, to determine the progress toward a degree.

Total Hours Required

The total hours on the degree plan must be at least 128. Note that the 128 hours **does not** include the two International and Cultural Diversity courses. This is because these classes can be used to satisfy both the International and Cultural Diversity requirement **and** another requirement on the degree plan—see our Web page for a list of the courses that can be used in this way. This is the **only** place where one course can be used in two places on the degree plan.

"Please note that the 128 total hours do not include a required foreign language. It is the student's responsibility to meet the University's foreign language requirement."

Comments and Observations

Before visiting the Undergraduate Advisor about a degree plan, the student should make as many decisions as possible. One problem area is transfer credits. It is sometimes difficult to know which courses may be used. Efforts are made to allow 'reasonable' substitutions. A student must submit a copy of his/her transcript evaluation and a completed substitution form along with the degree plan form if credit for transferred courses is desired.

It is the **student's responsibility** to have a degree plan meet minimum requirements. Everyone involved will check, but if a graduating senior's degree plan is not acceptable (e.g., only 127 hours), the student will not graduate until the problems have been corrected.

Required Courses

Take all courses listed on the Degree Plan. **All courses inside the boxes must be passed with a grade of "C" or better.**

CE Area Elective Courses

Fifteen (15) hours of CE area electives are required (5 courses). In meeting this requirement, students are required to satisfy two depth tracks, each consisting of two courses (four courses total). The listing of depth tracks is provided separately. The remaining course can be chosen from approved CPSC, ECEN, or ENGR 385/270/470 classes:

Computer Science and Engineering Courses (CSCE)

Take any 300+ or 400+ courses from the Computer Science and Engineering Department that are not included in the required courses list. Students wishing to use CSCE 485, CSCE 489, or CSCE 491 must receive approval from the undergraduate advisor (CSCE dept.).

Electrical and Computer Engineering Courses (ECEN)

Take ECEN 322, ECEN 326, ECEN 338, 351, 370 or any ECEN 400+ course except for those already required (e.g., ECEN 454) or equivalent to one required (e.g., ECEN 405, ECEN 449). Students wishing to take ECEN 485 or ECEN 489 must receive approval from the **CSCE dept.** undergraduate advisor.

Other Courses

ENGR 385 (co-op) credits and EPICS (ENGR 270 and 470) credits may be used to fulfill CE area elective requirements. Excess credits above 3 cannot be used. Students *are* allowed to combine ENGR 385 credits with EPICS course credits; see CSCE advising for details.

Engineering Technical Elective Course

A three (3) hour Engineering Technical Elective course is required. The list of approved courses is provided separately.

Humanities

ENGR 482 (PHIL 482) is a required course. You must take a writing intensive section (a "900" section) of this course.

Visual and Performing Arts Elective

Three (3) hours of visual and performing arts electives must be selected from the list of College of Engineering directed electives for visual and performing arts—please refer to the undergraduate catalog.

Social Science Elective Course

Three (3) hours of social science electives are required which must be selected from the list of College of Engineering directed electives for social science courses—please refer to the undergraduate catalog.

International and Cultural Diversity

See the list of course choices in the undergraduate catalog. Some of these courses can also be used to satisfy the Visual and Performing Arts, Social Science, or American History requirements. To find International and Cultural Diversity courses that satisfy multiple requirements, see the undergraduate catalog and look for classes that are on both lists.

CITIZENSHIP

History Courses

Six (6) hours of American history are required (three hours of which may be in Texas State history). Students taking advanced ROTC may substitute 6-hours of advanced military science courses for 3 hours of American history.

Political Science Courses

Six (6) credit hours of political science are required which include **POLS 206** and **207**. Students taking advanced ROTC may substitute 6-hours of advanced military science courses for one of these courses. There are restrictions on which courses can be transferred to meet this requirement. See the CSCE undergraduate advising office for details if this applies to you.

Physical Education Courses

Two (2) hours of KINE courses are required. One (1) hour of **KINE 198 -- Health and Fitness** (these courses may be taken pass fail or for a grade); and one (1) hour of **KINE 199 -- Activity** (these courses must be taken pass/fail).

English, Speech and Writing Courses

Six (6) hours of English/communications courses are required which include **ENGL 104.** The second choice is one of the following: **ENGL 210** or **ENGL 301** (technical writing), **ENGL 241, COMM 205,** or **COMM 243**. English AP credit will generally provide credit for ENGL 104 and credit from the English Language and Composition AP test may

provide credit for ENGL 241. Please note that ENGL 203, credit, which may be awarded by the English Literature and Composition AP test, is **not** technical writing and does **not** meet the technical writing requirement. Texas A&M University no longer teaches ENGL 201, but credit for this class can be obtained from other institutions (ENGL 2311), so it remains on the approved list.

Foreign Language Requirement

Proficiency in a foreign language is also required to graduate from Texas A&M University. This requirement can be met by:

- Completing two units (two full years) of high school course work in the same foreign language.
- Completing two semesters (one full year) of course work at the college level in the same foreign language, or
- Demonstrating proficiency in a foreign language by examination. See the undergraduate catalog for additional requirements under graduation requirements and Foreign Language.