




UNDERGRADUATE CURRICULUM CHANGE MEMO

Date: February 3, 2020

From: Roger Gonzalez, Chair of Engineering Education and Leadership Department 

Through: Louis Everett, Chair of Curriculum Committee, College of Engineering

Through: Norman Love, Associate Dean for Academic Affairs and Undergraduate Studies, College of Engineering 

Through: Theresa Maldonado, Dean, College of Engineering 

To: Carla Ellis, Chair of University Curriculum Committee

Proposal Title: Proposed Changes to the BS in Engineering Leadership Degree Name and Plan

Explain the nature of the change and the rationale.

The Department of Engineering Education and Leadership (EEL) proposes the following changes to the B.S. in Engineering Leadership degree.

- 1) Degree Name Change: Given the evolving nature of our new degree since 2014 coupled with the emphasis our degree has on innovation and entrepreneurship with significant input from key stakeholders, we would like to change the degree name by adding "Innovation" to its title. That is, the new degree name to be: *Engineering Innovation and Leadership*.
- 2) Adding a *Mechanical Engineering Sequence* to our existing six sequences. (See changes in Concentrations section of Catalog.)
- 3) Changing the name of our current Engineering Mechanics Sequence to *Civil Engineering Concentration* to more clearly reflect its coursework and not confuse it with the Mechanical Engineering Concentration.
- 4) Changing the naming of the current General Engineering Sequence to *Engineering Innovation Sequence*.
- 5) Since CS 1320 is now part of the University Core, all sequences, except the CS sequence, will take it instead of COMM 1302.
- 6) Two minor pre-req changes, to EL 1405 and EL 2301. (See attached forms.)
- 7) To become consistent with the COEN descriptors and nomenclature, we will change the naming of our "concentration" to "emphasis" and also "sequence" to "concentration".

The University of Texas at El Paso

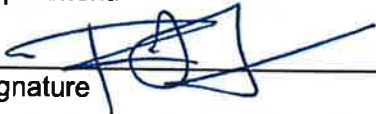
Curriculum Change Proposal

Approval Page

Proposal Title: Proposed Changes to the BS in Engineering Leadership
Degree Name and Plan

Department Chair Roger V. Gonzalez


I have read the enclosed proposal and approve this proposal on behalf of the department.


Signature

Feb 3, 2020
Date

College Curriculum Committee Chairperson

I have read the enclosed documents and approve the proposal on behalf of the college curriculum committee.


Signature

2/17/20
Date

College Dean

I have read the enclosed documents and approve the proposal on behalf of the college. I certify that the necessary funds will be allocated by the college in support of this proposal.


Signature

Feb. 17, 2020
Date

Graduate Council/Undergraduate Curriculum Committee

Council Action: Approved Returned to the College

Date of Action Report: _____

Signature, Chairman

Date

Texas Higher Education Coordinating Board

Existing Degree Program Title Change Request

Directions: Complete this form to request a change to the title (name) of an existing degree program. The degree program must already be on an institution's program inventory. A degree program title consists of the following two parts:

- 1) degree designation, such as Bachelor of Science (BS), Master of Arts (MA), or Doctor of Philosophy (PhD); and,
- 2) name of the discipline, such as History, Mechanical Engineering, or Zoology.

NOTE: This form requires the signature of the Provost or Chief Academic Officer.

Submit the *Degree Program Title Change Request* via the Online Submission Portal:

<https://www1.thecb.state.tx.us/apps/proposals/>

Information: Contact the Division of Academic Quality and Workforce at 512/427-6200.

Administrative Information

1. **Institution:** The University of Texas at El Paso

2. **Current Degree Program Title** – *Show how the program appears on the Coordinating Board's approval letter (e.g., Bachelor of Business Administration degree with a major in Accounting):*

Bachelor of Science in Engineering Leadership

3. **Degree Program CIP Code:**

14.0101 06

4. **Contact Person:** *Provide contact information for the person who can answer specific questions about the degree program.*

Name: Roger V. Gonzalez

Title: Department Chair, Engineering Education & Leadership

E-mail: rvgonzalez@utep.edu

Phone: 915-747-5909

Request for Change in Degree Program Designation (e.g., Bachelor of Science (BS), Master of Arts (MA), or Doctor of Philosophy (PhD))

Current Degree Program Designation:

Proposed Degree Program Designation:

Implementation Date (MM/DD/YYYY):

Reason for Change:

Describe why this change would be beneficial to students and/or the degree program.

Request Change in Name of Discipline (e.g., History, Mechanical Engineering, or Zoology)

Current Name: B.S. in Engineering Leadership

Proposed Name: B.S. in Engineering Innovation and Leadership

Implementation Date (09/01/2020):

Reason for Change:

Describe why this change would be beneficial to students and/or the program.

Given the evolving nature of our new degree since 2014, coupled with the emphasis our degree has on innovation and entrepreneurship with significant input from key stakeholders, we would like to change the degree name by adding "Innovation" to its title, as this better describes the nature of our degree.

Signature of Compliance

I hereby certify that all of the above changes have been approved in accordance with the procedures required by my institution, system office, and Board of Regents, as applicable.

Provost/Chief Academic Officer


Date



*Department of Civil
Engineering*

Memo

To: Undergraduate Curriculum Committee

From: Dr. Carlos Ferregut, Chair
Department of Civil Engineering 

Date: February 10, 2020

Subject: CE Concentration in the BS Engineering Leadership Degree

This memo is to indicate my support in renaming the current "Engineering Mechanics" Concentration to "Civil Engineering" (CE) Concentration. With the new addition of a Mechanical Engineering (ME) Concentration to the E-Lead program this name change will assist in reducing confusion between the CE and ME concentrations.

*Engineering Annex A-225
500 W. University Ave.
El Paso, Texas 79968
(915) 747-5464
FAX: (915) 747-8037*



*Department of
Mechanical Engineering*

To: Undergraduate Curriculum Committee
From: Dr. Jack Chessa, Chair Department of Mechanical Engineering
Date: February 10, 2020
Subject: ME Concentration in the BS Engineering Leadership Degree

This memo is to indicate the support of the Mechanical Engineering Department in adding a Mechanical Engineering (ME) Concentration to the B.S Degree in Engineering Leadership in the upcoming 2020 academic catalog. We believe that this concentration has been constructed in such a manner that it sufficiently justifies this title and support its adoption. The ME Concentration has been developed in collaboration between our two respective Chairs and Undergraduate Program Advisors and has the approval of the faculty of the Mechanical Engineering Department.

Sincerely,

A handwritten signature in black ink, appearing to be 'J. Chessa', with a long horizontal flourish extending to the right.

Jack Chessa
Department Chair
Department of Mechanical Engineering
jfchessa@utep.edu
(915) 747-6900

Cc: Ms. Myra Rodarte

*Suite 126
Engineering Annex
500 W. University Ave.
El Paso, Texas
79968-0521
(915) 747-5450
Fax: (915) 747-5019*

B.S. in Engineering Innovation and Leadership ~~Engineering Leadership~~

The B.S. in Engineering Innovation and Leadership ~~Engineering Leadership~~ program (BSE|L) offers a rigorous and flexible major in Engineering with ~~an~~ in-depth study of leadership and its effect upon engineering and society. The program includes ~~tracks in Business, Education, and Technical Specialization sequences concentrations in UTEP engineering fields. Each track contains 12 hours of core competencies.~~ The Engineering Innovation and Leadership program and its associated ~~tracks sequences concentrations~~ meet the curricular accreditation requirements of the Engineering Accreditation Commission of ABET using the criteria for General Engineering.

"We live in a technological age, and if our society is to flourish, many of our leaders should be engineers, and many of our engineers should be leaders" — Samuel Florman, *The Interactive Engineer*, 1997

Program Educational Objectives

Graduates of this program will

1. Value the role of engineering and leadership for the betterment of community and society.

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Elaboration: Our graduates will value and will demonstrate ~~their~~ ability to recognize leadership opportunities and to take initiative for beneficial change. They will understand the broader ~~impacts social, economic, and ethical implications~~ of their endeavors both inside and outside of engineering, ~~and~~ they ~~social, economic, environmental, or ethical.~~ They will be cognizant of their professional, civic, and societal responsibilities.

2. Inventively cultivate success in their field by demonstrating technical competence and problem solving skills, which will foster success in a variety of postgraduate environments, including professional practice and graduate school.

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Elaboration: Our graduates will have a solid grounding in fundamental principles of engineering, mathematics, and science, and they will apply this knowledge to a variety of systems inside and outside of engineering. They will be able to

develop inventive solutions that are responsive to technical, social, economic, and cultural considerations and constraints among others.

3. Possess attributes for assuming increasing levels of professional responsibility within and beyond engineering.

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Elaboration: In accelerating their ability to innovate and lead, our graduates will dDevelop their cCharacter, cCompetency, and cCapacity. They Our graduates will also develop a deep understanding of engineering, mathematics, science, business, and entrepreneurship. They will build on this foundation by engaging in independent and team learning to identify and to respond to emerging technical and societal developments.

Admission Requirements

New and returning students can declare their intention to work toward an Engineering Leadership degree if they meet UTEP's admission requirements. Students will not be admitted into the Engineering Leadership program begin to take Engineering Innovation and Leadership Engineering courses or be permitted to take Engineering Leadership courses until when they are pre-calculus-ready (can register for MATH 1508141105 or higher). Each semester, students admitted into the BSE|L program must prepare for their ensuing registration by preparing a plan of study and, when this is completed, meeting with a BSE|L advisor for approval of their courses.

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Engineering Sequence Concentration Selection:

Students will select a particular engineering sequence Concentration or a specialized combination of discipline specific courses. Students can choose from the following engineering sequences Concentrations:

- General Engineering Innovation Engineering
- Biomedical Engineering
- Electrical Engineering
- Civil Engineering Mechanics
- Computer Science
- Biomedical Engineering
- Electrical Engineering
- Mechanical Engineering, or
- Metallurgical and Materials Engineering, or
- Computer Science.

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Students who choose these tracks will likely proceed into either conventional engineering employment or into graduate school to obtain an M.S. or a Ph.D. in Engineering.

Joint-Degree BS-MBA Program

Students with at least 90 hours accumulated toward their BSEL degree, a cumulative GPA of at least 3.30, and admission to the full-time MBA program can pursue a joint-degree BS-MBA program. Students admitted to this program

(a) will apply credit for ECON 5360 Global Econ Environment-Mgrs, SLAW 5306 Business Law and Ethics, and ACCT 5301 Financial Accounting toward the requirements of three track electives in Engineering Leadership and (b) will apply graduate credit for (a) EL 4395 CD I: Definition & Exploration, (b) EL 4396 CD II: Develop & Evaluation, and (c) ENGR 4320 toward the elective requirements of the MBA program.

Degree Plan

Required Credits: 125 University

Core Curriculum (45 er hrs)

Complete the University Core

Curriculum requirements.

Designated Core

CE 2326 Econ for Engrs & Scientists

3

CS 1320 Computer Programming for Sci/Engr 3 (Exception CS Concentration take
COMM 1302 Business/Professional Comm (C) 3.)

3

COMM 1302 Business/Profession Comm (C) 3

MATH 1411 Calculus I _____ 4

PHIL 2306 Ethics (C) _____ 3

PHYS 2420 Introductory Mechanics _____ 4

PHYS 2421 Introductory Electromagnetism _____ 4

UNIV 1301 Seminar/Critical Inquiry (C) _____ 3

Foundation Math/Sci (15 cr hrs)

CHEM 1305 General Chemistry

3

MATH 1312 Calculus II _____ 3

MATH 2313 Calculus III 3 (CS Sequence Concentration take MATH 2300 Discrete
 Math) _____ 3

MATH 2326 Differential Equations _____ 3

MATH 3323 Matrix Algebra 3 (Exception BME Sequence Concentration take Upper
 Division BIOL, CHEM, or CBCH course from list approved for BME Minor)

Engineering Innovation and Leadership Coursework (28 cr hrs)

All EL courses must be completed with a grade of "C" or better

EL 3003 Professional Practice I _____ 0

EL 3005 Professional Practice II _____ 0

EL 1302 Intro to Eng Design & Leadshp _____ 3

EL 1405 Fund of Engr Lead and Graphics _____ 4

EL 2301 Modeling and Simulation _____ 3

EL 3302 Engineering Measurements _____ 3

EL 3331 Engr Design: People to Products _____ 3

EL 3332 Engr Entrepreneurship: Products to People _____ 3

EL 3373* Eng Prob. & Statistical Models _____ 3

EL 4395 Capstone Design I: Definition & Exploration _____ 3

EL 4396 Capstone Design II: Develop & Evaluation 3

* May substitute IE 3373 or EE 3384

EmphasisConcentration Courses (12 cr hrs)

In the Concentrationsequences below, a student must take twelve (12) credit hours of
Emphasisconcentration courses approved by the Ddepartment. These courses must
 constitute an approved plan of study and can be inside or outside of engineering.
 Exceptions include those students taking the CS or BME ConcentrationSequence (see
 required Emphasisconcentration courses for CS or BME ConcentrationSequence

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below). Emphasis courses for Engineering Innovation Concentration may include: EL 3320, EL 3330, EL 4330, EL 4332, EL 4331, EL 4334, and EL 4393, or other courses approved by the Department.

Sequences Concentrations

Choose one of the following ~~seven~~ six sequences Concentrations:

Engineering Innovation General Engineering Sequence Concentration

(25 cr hrs)

Engineering Innovation General Engineering Sequence Concentration Courses

Upper Division Engineering / Technical Electives

9 cr hrs approved by the Department advisor

9

Additional Required Courses

CE 2377 <u>or IE 2377 or ME 2342</u> Electro Mechanical Systems	3
CE 2338 Mechanics II (Dynamics) <u>or ME 2340 Mechanics II - Dynamics</u>	3
MECH 2311 Intro to Thermal-fluid Sci	3
MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4

Total Hours 125

Biomedical Engineering Sequence Concentration (37 cr hrs)

Biomedical Engineering Sequence Concentration Courses (required Emphasis concentration courses in this Sequence Concentration)

BIOL 1305 General Biology	3
BIOL 1107 and Topics in Study of Life I	1
BIOL 2313 Human Anat/Physiology II (C)	3
BIOL 2113 and Human Anat/Physio Lab II (C)	1
OR BIOL 2311 Human Anat/Physiology I (C)	3
BIOL 2111 and Human Anat/Physio Lab I	1

4 cr hrs approved by the Department

4

Additional Required Courses

CE 2377 <u>or IE 2377 or ME 2342</u> Electro Mechanical Systems	3
CE 2338 Mechanics II (Dynamics) <u>or ME 2340 Mechanics II - Dynamics</u>	3
MECH 2311 Intro to Thermal-fluid Sci	3
MME 2303 Intro to Materials Sci & Engrg	3

MME 2434 Mechanics of Materials	4
Upper Division Engineering Technical Electives	
BME 3303 Fundamentals of BME I	3
BME 3305 Fundamentals of BME II	3
Upper Division Course from list approved for BME Minor	3

Total Hours 125

Computer Science Sequence Concentration (37 or hrs)

Computer Science Sequence Concentration Courses (required Emphasis concentration courses in this Sequence Concentration)

CS 1301 Intro to Computer Science	3
CS 1101 Intro to Computer Science Lab	1
CS 2302 Data Structures	3
CS 2401 Elem. Data Struct./Algorithms	4
EL 4171 Eng Ed and Lead Problems	1

Upper Division Engineering / Technical Electives

9 or hrs from the following courses or as approved by the Department advisor

9

CS 3320, CS 3331, CS 3350, CS 3360, CS 3370, CS 3432, CS 4310, CS 4311, CS 4316, CS 4317, CS 4320, CS 4330, CS 4339, CS 4342, CS 4351, CS 4352, CS 4364, CS 4365, CS 4371, CS 4373, CS 4374, CS 4375, CS 4376, CS 4377, CS 4379, CS 4387, CS 4390, CS 4392

Additional Required Courses

CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems	3
CE 2338-Mechanics-II-(Dynamics) or ME 2340-Mechanics II--Dynamics	3
EE 2369 Digital Systems Design I	3
EE 2169 Laboratory for Digital Systems Design I	1
MECH 2311 Intro to Thermal-fluid Sci	3
MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4

Note required Math Course for CS Sequence Concentration (see Foundation Math/Sci above)

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Total Hours 125

Electrical Engineering Sequence Concentration (25 cr hrs)

Electrical Engineering Sequence Concentration Courses

GS 1320 Computer Programming-Sci/Engr 3

EE 2369 Digital Systems Design I 3

EE 2169 Laboratory for EE 2369 1

EE 2350 Electric Circuits I
3

EE 2351 Electric Circuits II
3

EE 2372 Software Design I 3

EE 3324-2352 Continuous Time Signals & Systems Electromagnetic Field Theory
3

EE 2372 Software Design I 3

Upper Division Engineering / Technical Electives:

9 cr hrs approved by the Department advisor

9 EE 33xx or EE 43xx Upper Division Elective 3

Students seeking the Academic Minor in EE must take 6 credit hours from the list (EE 3321, EE 3329, EE 3338 & EE 3138, EE 3340, EE 3376 & EE 3176, EE 3384, EE 3353)

EE 33xx or EE 43xx Upper Division Elective 3

Total Hours 125

Civil Engineering Mechanics Sequence Concentration (25 cr hrs)

Civil Engineering Mechanics Sequence Concentration Courses

Upper Division Civil Engineering / Technical Electives

6 cr hrs of CE courses approved by the EEL Department

6

Additional Required Courses

CE 1301 Civil Engineering Fundamentals 3

CE 2315 Statics 3

CE 2334 Mechanics of Materials 3

CE 2375 Introduction to Thermal-Fluid Science	Mechanics	3
CE 2343 Structural Analysis	2377 or IE-2377 or ME 2342 Electro-Mechanical Systems	3
OR CE 3336 Civil Engineering Materials		3
OR CE 2385 Environmental Engr Fundamental		3
CE 2338 Mechanics II (Dynamics)	or ME 2340 Mechanics II - Dynamics	3
EL 4171 Eng Ed and Lead Problems		1

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Total Hours 125

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Mechanical Engineering Concentration (25 cr hrs)

Mechanical Concentration Required Courses (13 SCH)

MECH 1321 – Mechanics I – Statics		3
MECH 2311 – Intro to Thermal-Fluid Sci		3
MECH 2322 – Mechanics of Materials		3
MECH 2103 – Engineering Computations		1
MECH 2340 – Mechanics II – Dynamics		3

Upper Division Engineering Technical Electives (9 SCH)

MECH 3312 – Thermodynamics		3
MECH 3314 – Fluid Mechanics		3
MECH 4315 – Heat Transfer		3

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Mechanical Concentration Elective (choose one) (3 SCH)

MECH 3345 System Dynamics		3
MECH 3334 Mechanical Design		3
AERO 3312 Aerodynamics I		3
AERO 3343 System Modelling and Control		3
AERO 3323 Aerospace Structures I		3
EL 4393 Special Topics in Engineering Leadership		3

Total Hours 125

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Metallurgical and Materials Engineering Sequence Concentration (25 cr hrs)

Metallurgical and Materials Engineering Sequence Concentration Courses

<u>Upper Division Metallurgical and Materials Civil Engineering / Technical Electives</u>	
<u>12 cr hrs of MME courses approved by the EEL Ddepartment</u>	
<u>12MME-2305-Material-&-Energy-Balance-3</u>	
<u>Upper-Division-Engineering-Technical-Electives</u>	
<u>MME-4309-Corrosion-3</u>	
<u>MME-4316-Failure-Analysis-3</u>	
Additional Required Courses	
<u>CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems</u>	<u>3</u>
<u>MME 2303 Intro to Materials Sci & Engrg</u>	<u>3</u>
<u>MME 2434 Mechanics of Materials</u>	<u>4</u>
<u>MME 4316 Failure Analysis</u>	<u>3</u>
<u>MME 3309 Electronic Mat Sci & Tech-3</u>	
<u>MME 3312 Biomat, Biomat Prntng & Dev-3</u>	
Total Hours 125	

The standard University Core Curriculum info follows here.

Ertas, Maxwell, Rainey and Tanik

During follow-up discussions, Kozmetsky advanced the word *transdisciplinary* to define the notion of the integrated use of the tools, techniques, and methods from various disciplines.

B.S. in Engineering Innovation and Leadership

The B.S. in Engineering Innovation and Leadership program (BSEIL) offers a rigorous and flexible major in Engineering with in-depth study of leadership and its effect upon engineering and society. The program includes concentrations in UTEP engineering fields. The Engineering Innovation and Leadership program and its associated concentrations meet the curricular accreditation requirements of the Engineering Accreditation Commission of ABET using the criteria for General Engineering.

"We live in a technological age, and if our society is to flourish, many of our leaders should be engineers, and many of our engineers should be leaders" — Samuel Florman, *The Interactive Engineer*, 1997

Program Educational Objectives

Graduates of this program will

1. Value the role of engineering and leadership for the betterment of community and society.

Elaboration: Our graduates will value and will demonstrate ability to recognize leadership opportunities and to take initiative for beneficial change. They will understand the broader impacts of their endeavors both inside and outside of engineering, be they social, economic, environmental, or ethical. They will be cognizant of their professional, civic, and societal responsibilities.

2. Inventively cultivate success in their field by demonstrating technical competence and problem solving skills, which will foster success in a variety of postgraduate environments, including professional practice and graduate school.

Elaboration: Our graduates will have a solid grounding in fundamental principles of engineering, mathematics, and science, and they will apply this knowledge to a variety of systems inside and outside of engineering. They will be able to develop inventive solutions that are responsive to technical, social, economic, and cultural considerations and constraints among others.

3. Possess attributes for assuming increasing levels of professional responsibility within and beyond engineering.

Elaboration: In accelerating their ability to innovate and lead, our graduates will develop their character, competence, and capacity. They will also develop a deep understanding of engineering, mathematics, science, business, and entrepreneurship. They will build on this foundation by engaging in independent and team learning to identify and to respond to emerging technical and societal developments.

Admission Requirements

Students admitted into the program begin to take Engineering Innovation and Leadership courses when they are pre-calculus-ready (can register for MATH 1508 or higher). Each semester, students admitted into the BSEIL program must prepare for their ensuing registration by preparing a plan of study and, when this is completed, meeting with a BSEIL advisor for approval of their courses.

Engineering Concentration Selection:

Students will select a particular engineering Concentration or a specialized combination of discipline specific courses. Students can choose from the following engineering Concentrations:

- Engineering Innovation
- Biomedical Engineering
- Civil Engineering,
- Computer Science
- Electrical Engineering
- Mechanical Engineering, or
- Metallurgical and Materials Engineering.

Students who choose these tracks will likely proceed into either conventional engineering employment or into graduate school to obtain an M.S. or a Ph.D. in Engineering.

Fast-Track Combined BSEIL/Masters Programs in Engineering

Students with at least 90 hours accumulated toward their BSEIL degree and a cumulative GPA of at least 3.30 may be eligible for admission into the fast-track BSEIL/Masters Program. Students admitted to this program take graduate classes that count both toward graduate degree requirements and undergraduate degree requirements, for up to 15 credit hours of graduate courses in the student's EIL concentration per approval of the undergraduate and graduate advisors. Eligible courses graduate courses come from a list approved for fast-track by the EEL Faculty. Students must earn a B or better in

the graduate course to count as graduate credit toward the graduate degree. If the grade is a C, it will not count towards the graduate degree but will still count towards the undergraduate degree.

Joint – Degree BS–MBA Program

Students with at least 90 hours accumulated toward their BSEIL degree, a cumulative GPA of at least 3.30, and admission to the full-time MBA program can pursue a joint-degree BS-MBA program. Students admitted to this program (a) will apply credit for **ECON 5360** Global Econ Environment-Mgrs, **BLAW 5306** Business Law and Ethics, and **ACCT 5301** Financial Accounting toward the requirements of three track electives in Engineering Leadership and (b) will apply graduate credit for (a) **EL 4395** CD I: Definition & Exploration, (b) **EL 4396** CD II: Develop & Evaluation, and (c) **ENGR 4320** toward the elective requirements of the MBA program.

Degree Plan Required Credits: 125

University Core Curriculum (45 cr hrs)

Complete the University Core Curriculum requirements.

Designated Core

CE 2326 Econ for Engrs & Scientists

3

CS 1320 Computer Programming for Sci/Engr (Exception CS Concentration take COMM 1302 Business/Professional Comm (C) 3.)

3

MATH 1411 Calculus I

4

PHIL 2306 Ethics (C)

3

PHYS 2420 Introductory Mechanics

4

PHYS 2421 Introductory Electromagnetism

4

UNIV 1301 Seminar/Critical Inquiry (C)

3

Foundation Math/Sci (15 cr hrs)

CHEM 1305 General Chemistry

3

MATH 1312 Calculus II

3

MATH 2313 Calculus III (CS Concentration take MATH 2300 Discrete Math)

3

MATH 2326 Differential Equations	3
MATH 3323 Matrix Algebra 3 (Exception BME Concentration take Upper Division BIOL, CHEM, or CBCH course from list approved for BME Minor)	
Engineering Innovation and Leadership Coursework (28 cr hrs)	
All EL courses must be completed with a grade of "C" or better	
EL 3003 Professional Practice I	0
EL 3005 Professional Practice II	0
EL 1302 Intro to Eng Design & Leadshp	3
EL 1405 Fund of Engr Lead and Graphics	4
EL 2301 Modeling and Simulation	3
EL 3302 Engineering Measurements	3
EL 3331 Engr Design: People to Products	3
EL 3332 Engr Entrepreneurship: Products to People	3
EL 3373* Eng Prob. & Statistical Models	3
EL 4395 Capstone Design I: Definition & Exploration	3
EL 4396 Capstone Design II: Develop & Evaluation 3	
* May substitute IE 3373 or EE 3384	
Emphasis Courses (12 cr hrs)	
In the Concentrations below, a student must take twelve (12) credit hours of Emphasis courses approved by the Department. These courses must constitute an approved plan of study and can be inside or outside of engineering.	
Exceptions include those students taking the CS or BME Concentration (see required Emphasis courses for CS or BME Concentration below). Emphasis courses for Engineering Innovation Concentration may include: EL 3320, EL 3330, EL 4330, EL 4332, EL 4331, EL 4334, and EL 4393, or other courses approved by the Department.	
Concentrations	
Choose one of the following seven Concentrations:	
Engineering Innovation Concentration (25 cr hrs)	
Engineering Innovation Concentration Courses	
Upper Division Engineering / Technical Electives	
9 cr hrs approved by the Department	9
Additional Required Courses	
CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems	3
CE 2338 Mechanics II (Dynamics) or ME 2340 Mechanics II - Dynamics	3
MECH 2311 Intro to Thermal-fluid Sci	3

MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4
Total Hours 125	
Biomedical Engineering Concentration (37 cr hrs)	
Biomedical Engineering Concentration Courses (required Emphasis courses in this Concentration)	
BIOL 1305 General Biology	3
BIOL 1107 and Topics in Study of Life I	1
BIOL 2313 Human Anat/Physiology II (C)	3
BIOL 2113 and Human Anat/Physio Lab II (C)	1
OR BIOL 2311 Human Anat/Physiology I (C)	3
BIOL 2111 and Human Anat/Physio Lab I	1
4 cr hrs approved by the Department	
4	
Additional Required Courses	
CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems	3
CE 2338 Mechanics II (Dynamics) or ME 2340 Mechanics II - Dynamics	3
MECH 2311 Intro to Thermal-fluid Sci	3
MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4
Upper Division Engineering Technical Electives	
BME 3303 Fundamentals of BME I	3
BME 3305 Fundamentals of BME II	3
Upper Division Course from list approved for BME Minor	3
3	
Total Hours 125	
Computer Science Concentration (37 cr hrs)	
Computer Science Concentration Courses (required Emphasis courses in this Concentration)	
CS 1301 Intro to Computer Science	3
CS 1101 Intro to Computer Science Lab	1
CS 2302 Data Structures	3

CS 2401 Elem. Data Struct./Algorithms	4
Upper Division Engineering / Technical Electives	
9 cr hrs from the following courses or as approved by the Department	9
CS 3320, CS 3331, CS 3350, CS 3360, CS 3370, CS 3432, CS 4310, CS 4311, CS 4316, CS 4317, CS 4320, CS 4330, CS 4339, CS 4342, CS 4351, CS 4352, CS 4364, CS 4365, CS 4371, CS 4373, CS 4374, CS 4375, CS 4376, CS 4377, CS 4379, CS 4387, CS 4390, CS 4392	
Additional Required Courses	
CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems	3
EE 2369 Digital Systems Design I	3
EE 2169 Laboratory for Digital Systems Design I	1
MECH 2311 Intro to Thermal-fluid Sci	3
MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4
Note required Math Course for CS Concentration (see Foundation Math/Sci above)	
Total Hours 125	
Electrical Engineering Concentration (25 cr hrs)	
Electrical Engineering Concentration Courses	
EE 2369 Digital Systems Design I	3
EE 2169 Laboratory for EE 2369	1
EE 2350 Electric Circuits I	3
EE 2351 Electric Circuits II	3
EE 2352 Continuous Time Signals & Systems	3
EE 2372 Software Design I	3
Upper Division Engineering / Technical Electives:	
9 cr hrs approved by the Department	9
Students must take 6 credit hours from the list (EE 3321, EE 3329, EE 3338 & EE 3138, EE 3340, EE 3376 & EE 3176, EE 3384, EE 3353)	
Total Hours 125	

Civil Engineering Concentration (25 cr hrs)

Civil Engineering Concentration Courses

Upper Division Civil Engineering Elective

6 cr hrs of CE courses approved by the Department 6

Additional Required Courses

CE 1301 Civil Engineering Fundamentals 3

CE 2315 Statics 3

CE 2334 Mechanics of Materials 3

CE 2375 Introduction to Fluid Mechanics 3

CE 2343 Structural Analysis 3

OR CE 3336 Civil Engineering Materials 3

OR CE 2385 Environmental Engr Fundamental. 3

CE 2338 Mechanics II (Dynamics) or ME 2340 Mechanics II - Dynamics 3

EL 4171 Eng Ed and Lead Problems 1

Total Hours 125

Mechanical Engineering Concentration (25 cr hrs)

Mechanical Concentration Required Courses (13 SCH)

MECH 1321 – Mechanics I – Statics 3

MECH 2311 – Intro to Thermal-Fluid Sci 3

MECH 2322 – Mechanics of Materials 3

MECH 2103 – Engineering Computations 1

MECH 2340 – Mechanics II – Dynamics 3

Upper Division Engineering Technical Electives (9 SCH)

MECH 3312 – Thermodynamics 3

MECH 3314 – Fluid Mechanics 3

MECH 4315 – Heat Transfer 3

Mechanical Concentration Elective (choose one) (3 SCH)

MECH 3345 System Dynamics 3

MECH 3334 Mechanical Design 3

AERO 3312 Aerodynamics I 3

AERO 3343 System Modelling and Control 3

AERO 3323 Aerospace Structures I 3

EL 4393 Special Topics in Engineering Leadership	3
Total Hours 125	
Metallurgical and Materials Engineering Concentration (25 cr hrs)	
Metallurgical and Materials Engineering Concentration Courses	
Upper Division Metallurgical and Materials / Technical Electives	
12 cr hrs of MME courses approved by the Department	12
Additional Required Courses	
CE 2377 or IE 2377 or ME 2342 Electro Mechanical Systems	3
MME 2303 Intro to Materials Sci & Engrg	3
MME 2434 Mechanics of Materials	4
MME 4316 Failure Analysis	3
Total Hours 125	

The standard University Core Curriculum info follows here.

[://www.arj.no/2012/03/12/disciplinaritles-2/](http://www.arj.no/2012/03/12/disciplinaritles-2/)

Granda, Virginia D

From: Ferregut, Carlos
Sent: Monday, February 10, 2020 12:14 PM
To: Gonzalez, Roger V
Cc: Carrasco, Cesar J.
Subject: RE: CE support of Name Change from Mechanics to Civil

Roger,

As per our conversation this morning I will go ahead and write the letter agreeing on the name change of the E-lead sequence from Engineering Mechanics to Civil Engineering with the understanding that you will go ahead and submit the following changes to the current sequence in the next cycle of curriculum revisions:

Delete: CE 2377 Electro Mechanical Systems
Add: CE 2343 or CE 3336 or CE 2385

Change the Upper Division Civil Engineering/Technical Elective title to Upper Division Civil Engineering Elective

This changes will align the E-lead Civil Engineering sequence to the Minor in Civil Engineering sequence.

Regards

cf

From: Gonzalez, Roger V <rvgonzalez@utep.edu>
Sent: Sunday, February 9, 2020 4:28 PM
To: Ferregut, Carlos <ferregut@utep.edu>
Cc: Carrasco, Cesar J. <ccarras@utep.edu>
Subject: Re: CE support of Name Change from Mechanics to Civil

Hi Carlos and Cesar:

The Civil sequence (which we are remaining all sequences to concentrations to be in line with UTEP nomenclature) has not changed. It is exactly as it is in the current catalog. Here is the [link](#). And screenshot below.

Engineering Mechanics Sequence

Engineering Mechanics Sequence Required Courses

CE 1301	Civil Engineering Fundamentals
CE 2315	Statics
CE 2334	Mechanics of Materials
CE 2338	Mechanics II (Dynamics)
CE 2375	Intro to Fluid Mechanics
CE 2377	Electro Mechanical Systems or IE 2377 or MECH 2342
EL 4171	Eng Ed and Lead Problems

Thx, RVG



Roger V. Gonzalez, PhD, PE, F.ASME, F. AIMBE
Chair and Professor

Engineering Education and Leadership
The University of Texas at El Paso
500 W. University Ave.; El Paso, TX 79968
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Office: 915-747-5909
eel.utep.edu

From: "Ferregut, Carlos" <ferregut@utep.edu>
Date: Sunday, February 9, 2020 at 4:06 PM
To: Roger Gonzalez <rvgonzalez@utep.edu>
Cc: "Carrasco, Cesar J." <ccarras@utep.edu>
Subject: RE: CE support of Name Change from Mechanics to Civil

Hi Roger,

I would be glad to support the name change but we are going to have to review the sequence before I signed the letter. I was thinking that you could specify the tree minors we have in the department as the sequences your students could

follow. We no longer offer electromechanical systems and it is no longer part of our curriculum. Kelvin Cheu also had some questions regarding the approval of upper division courses. Let's talk.

cf

From: Gonzalez, Roger V <rvgonzalez@utep.edu>
Sent: Saturday, February 8, 2020 4:17 PM
To: Ferregut, Carlos <ferregut@utep.edu>
Subject: CE support of Name Change from Mechanics to Civil

Hi Carlos:

The UGCC approved the E-Lead changes for the 2020 catalog. They asked for a memo indicating your support of this name change. I have taken the liberty to draft the memo for you (see attached). Feel free to edit as needed.

Could you sign when done and email it back or I can have it picked up at your office?

Thanks Carlos. Let me know if questions.

COURSE CHANGE FORM

All fields below are required

College : Engineering

Department : Engineering Education & Leadership

Rationale for changing the course:

Change from prerequisite to corequisite: MATH 1411 no longer a prerequisite. MATH 1508 Precalculus OR MATH 1310 Trigonometry and Conics [Second semester of Precal] being a corequisite.

All fields below are required

Subject Prefix and number EL 1405

Course Title Fund of Engr Lead and Graphics

Change	From	To
Ex. Prerequisite	Ex. POLS 2310	Ex. POLS 2312
Prerequisite	MATH 1411	N/A
Corequisite	N/A	MATH 1411 OR MATH 1508 OR MATH 1310
Description	This course equips students with fundamental skills to help thrive during pursuit of their BS in Engineering Innovation and Leadership. Therefore, a major focus of the course is to help students develop their own identity as leaders and as engineers. Another focus of the course is to build community and culture within the E-Lead Program. Further, this course introduces students to the flipped classroom and project based learning styles common in E-Lead courses. The final focus of this course is the development of critical engineering graphics skills for students.	This course equips students with fundamental skills to help thrive during pursuit of their BS in Engineering Innovation and Leadership. Therefore, a major focus of the course is to help students develop their own identity as leaders and as engineers. Another focus of the course is to build community and culture within the Program. Further, this course introduces students to the flipped classroom and project based learning styles common in EL courses. The final focus of this course is the development of critical engineering graphics skills for students

COURSE CHANGE FORM

All fields below are required

College : Engineering

Department : Engineering Education & Leadership

Rationale for changing the course:

Change of prerequisite and addition of prerequisite. MATH 1312 changed to MATH 1411. Add CS 1320 prerequisite, exception: CS Concentration must take CS 1301.

All fields below are required

Subject Prefix and number EL 2301

Course Title Modeling and Simulation

Change	From	To
Ex. Prerequisite	Ex. POLS 2310	Ex. POLS 2312
Prerequisite	EL 1302 w/C or better	EL 1302 w/C or better
Prerequisite	MATH 1312 w/C or better	MATH 1411 w/C or better
Prerequisite	N/A	CS 1320 w/C or better, except CS Concentration (requires CS 1301 w/C or better)
Description	This course introduces the use of difference and differential equations in the modeling of systems with examples drawn from the life and natural sciences, engineering, and business. Computer simulations are developed using programming Matlab. Topics also include leadership theories and practices.	This course introduces the use of difference and differential equations in the modeling of systems with examples drawn from the life and natural sciences, engineering, and business. Computer simulations are developed using programming Matlab. Topics also include leadership theories and practices.
Prerequisite		