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| For Academic Affairs and Research Use Only |
| Proposal Number |  |
| CIP Code:  |  |
| Degree Code: |  |

**Reconfiguration of Existing Degree Program Proposal Form**

(Also requires Arkansas Department of Higher Education (ADHE) approval)

**[X] Undergraduate Curriculum Council**

**[ ] Graduate Council**

Signed paper copies of proposals submitted for consideration are no longer required. Please type approver name and enter date of approval.

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| Andre Possani Espinosa | 9/23/2021 |

**Department Curriculum Committee Chair** |

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**COPE Chair (if applicable)** |
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| Andre Possani Espinosa | 9/23/2021 |

**Department Chair** |

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**Head of Unit (if applicable)**   |
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| Mary Elizabeth Spence | 9/29/2021 |
| **Office of Assessment** |  |

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**Undergraduate Curriculum Council Chair** |
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| Jason Stewart | 9/24/2021 |

**College Curriculum Committee Chair** |

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**Graduate Curriculum Committee Chair** |
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| Abhijit Bhattacharyya | 9/24/2021 |

**College Dean** |

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| Alan Utter | 10/11/2021 |

**Vice Chancellor for Academic Affairs** |
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**General Education Committee Chair (if applicable)**   |  |

1. **Contact Person** (Name, Email Address, Phone Number)

Andre Possani Espinosa, apossaniespinosa@astate.edu, +52 419 689 0354 ext. 2061

1. **Title(s) of degree programs to be consolidated/reconfigured:**

BSEE in Electrical Engineering

1. **Proposed title of consolidated/reconfigured program:**

BS in Electrical Systems Engineering

1. **Proposed Effective Date:** Fall 2022
2. **Reason for proposed program consolidation/reconfiguration:**

*(Indicate student need/demand (projected enrollment) for the proposed program and document that the program meets employer needs using the ADFA Workforce Analysis Form)*

Arkansas State University campus Queretaro must follow policies from both the United States of America and Mexico. In Mexico, the Public Education Ministry (*Secretaria de Educación Pública – SEP*) allows changes to an undergrad program only every 5 years. To comply with this policy and keep our degrees updated, a more flexible engineering program is proposed.

1. **Provide current and proposed curriculum outline by semester.**

*For undergraduate programs, please use Appendix A-8-semester plan form*

 *Indicate total semester credit hours required for the proposed program. If new courses are needed for the reconfiguration, approval for the courses must be requested prior to approval for the new degree. Underline any new courses. Identify required general education core courses with an asterisk. If utilizing courses from other departments, please color-code them and provide a key.*

The proposed curriculum has a total of 128 credits, the same as the current curriculum. The proposed curriculum follows the exact same General Education (38 credits) and Engineering Core (20 credits) courses as the current curriculum. Changes are only present on the Major courses. To make the proposed curriculum more flexible, 7 mandatory courses from the current curriculum become Engineering Electives. They allow the proposed curriculum to have 21 credits that can change year by year without the need of approval from the Public Education Ministry of Mexico (SEP). All 7 affected courses belong to the College of Engineering and Computer Science. Along with all engineering courses, the 7 affected courses stay as part of the list of electives. Only 3 new Electrical Systems Engineering ESE electives are added to the list of engineering electives.

1. **Will the proposed degree be offered:**
	1. **Traditional/Face-to-face** Yes
	2. **Distance/Online** No
		1. **If yes, indicate mode of distance delivery, and the percentage of courses offered via this modality (<50%, 50-99%, or 100%).**

Enter text...

* + 1. **If online, will it be offered through Global Initiatives/Academic Partnerships (AP)?**

Enter text...

1. **Will the proposed degree be offered off-campus?** Yes
	1. **If yes, identify the off-campus location**

Arkansas State University campus Queretaro

1. **Provide documentation that proposed program has received full approval by licensure/certification entity, if required.**

 *(A program offered for teacher/education administrator licensure must be reviewed/approved by the Arkansas Department of Education prior to consideration by the Coordinating Board; therefore, the Education Protocol Form also must be submitted to ADHE along with the Letter of Notification).*

The BSESE program will be accredited by ABET. However, the ABET accreditation process requires that the program produces at least 1 graduate before the accreditation evaluation can take place.

1. **List institutions offering similar program and identify the institutions used as a model to develop the proposed program.**

Arkansas State University – BSEE Electrical Engineering

1. **Provide scheduled program review or specialized accreditation initial review date (within 10 years of program implementation).**

No earlier than Fall 2024; no later than Fall 2027

1. **Is there differential tuition requested?** *If yes, please fill out the New Program/Tuition and Fees Change Form.*

No

1. **Graduate programs only: Will this program require a comprehensive exam?**

Enter text...

**Student Learning Outcomes**

Provide outcomes that students will accomplish during or at completion of this reconfigured degree. Fill out the following table to develop a continuous improvement assessment process.

*For further assistance, please see the ‘Expanded Instructions’ document available on the UCC - Forms website for guidance, or contact the Office of Assessment at 870-972-2989.*

**University Outcomes**

Please indicate the university-level student learning outcomes for which this new program will contribute. Please complete the table by adding program level outcomes (PLO) to the first column, and indicating the alignment with the university learning outcomes (ULO). If you need more information about the ULOs, go to the [University Level Outcomes Website](http://www.astate.edu/a/assessment/student-learning-outcomes/files/ULOs%20for%20Website2.pdf).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **ULO 1: Creative & Critical Thinking** | **ULO 2: Effective Communi-cation** | **ULO 3: Civic & Social Responsibility** | **ULO 4: Globalization & Diversity** |
| **PLO 1**: An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. | **X** |  |  |  |
| **PLO 2:** An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. | **X** |  | **X** |  |
| **PLO 3**: An ability to communicate effectively with a range of audiences. |  | **X** |  |  |
| **PLO 4:** An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. | **X** |  | **X** | **X** |
| **PLO 5:** An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives. | **X** | **X** | **X** |  |
| **PLO 6:** An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. | **X** | **X** |  |  |
| **PLO 7:** An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. | **X** |  |  |  |

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| **Outcome 1** | An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment90% of ESE students score 3.0 or higher on their portfolio evaluations (graded work, exams, papers, etc.) from the following course:EE 4313 Control Systems Theory |
| Which courses are responsible for this outcome? | EE 4313 Control Systems Theory |
| Assessment Timetable | Collect data whenever EE 4313 is offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches EE 4313. |

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| **Outcome 2** | An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment90% of ESE students score 3.0 or higher on their portfolio evaluations (graded work, exams, papers, etc.) from the following courses:ENGR 4482 Senior Design IIEE 4353 Power Systems |
| Which courses are responsible for this outcome? |  EE 4353 Power Systems and ENGR 4482 Senior Design II |
| Assessment Timetable | Collect data whenever ENGR 4482 and EE 4353 are offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches ENGR 4482 and EE 4353. |

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| **Outcome 3** | An ability to communicate effectively with a range of audiences. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment100% of ESE students in ENGR 4463 score 70/100 or higher on their exam questions related to written communication85% of students evaluated on oral communication skills by performance appraisal in ENGR 4482 score 3.0 or higher using the assessment instrument85% of ESE students having writing skills evaluated on a progress report in ENGR 4482, Senior Design II, or another late term writing, will have average scores of 3.0 or higher. |
| Which courses are responsible for this outcome? | ENGR 4463 and ENGR 4482 |
| Assessment Timetable | Collect data whenever ENGR 4463 and ENGR 4482 are offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches ENGR 4463 and ENGR 4482. |

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| **Outcome 4** | An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment 100% of ESE students in ENGR 4463 score 70/100 or higher on their exam questions about ethics. 90% of students will score 3.0 or higher on portfolio evaluations (graded work, exams, papers, etc.) relative to this outcome performed by faculty from EE 4353 Power Systems |
| Which courses are responsible for this outcome? | ENGR 4463 and EE 4353. |
| Assessment Timetable | Collect data whenever ENGR 4463 and EE 4353 are offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches ENGR 4463 and EE 4353. |

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| **Outcome 5** | An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objective. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment* 90 % of ESE students evaluated by behavioral observation in ENGR 4482 score 3.0 or higher using the assessment instrument.
* 100% of ESE students in ENGR 4463 score 70/100 or higher on exam questions related to functioning as an effective team member.
 |
| Which courses are responsible for this outcome? | ENGR 4463 and ENGR 4482. |
| Assessment Timetable | Collect data whenever ENGR 4463 and ENGR 4482 are offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches ENGR 4463 and ENGR 4482. |

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| **Outcome 6** | An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment90% of ESE students score 3.0 or higher on their portfolio evaluations (graded work, exams, papers, etc.) from the following course:EE 3401 Electronics I Lab |
| Which courses are responsible for this outcome? | EE 3401. |
| Assessment Timetable | Collect data whenever EE 3401 is offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches EE 3401. |

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| **Outcome 7** | An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. |
| Assessment Procedure Criterion | Indirect AssessmentSurveys of graduating seniors (each semester)Surveys of Alumni (every two years)Surveys of Employers (every two years)Direct Assessment* 100% of students in ENGR 4463 will score 70/100 on questions related to acquisition and application of new knowledge
* 90% of students evaluated by performance appraisals in ENGR 4482 for acquisition and application of new knowledge using appropriate learning strategies will score 3.0 (adequate/satisfactory) or higher using the assessment instrument
 |
| Which courses are responsible for this outcome? | ENGR 4463 and ENGR 4482 |
| Assessment Timetable | Collect data whenever ENGR 4463 and ENGR 4482 are offered. Assess every 3 years according to the College of Engineering and Computer Science assessment schedule. |
| Who is responsible for assessing and reporting on the results? | Indirect assessment: the Director of Engineering at campus Queretaro.Direct assessment: the Professor who teaches ENGR 4463 and ENGR 4482. |

**Appendix A, 8-Semester Plan**

(**Referenced in #9** - **Undergraduate Proposals Only)**

*Instructions: Please identify new courses in italics*.

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| **Arkansas State University campus Queretaro****Degree: Bachelor of Science****Major: Electrical Systems Engineering****Year: 2022** |
| Students requiring developmental course work based on low entrance exam scores (ACT, SAT, ASSET, COMPASS) may not be able to complete this program of study in eight (8) semesters. Developmental courses do not count toward total degree hours. **Students having completed college level courses prior to enrollment will be assisted by their advisor in making appropriate substitutions. In most cases, general education courses may be interchanged between semesters.** A minimum of 45 hours of upper division credit (3000-4000 level) is required for this degree. |
| **Year 1** |  | **Year 1** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| COMS 1203 | Oral Communication | 3 | X |  | ENG 1013 | Composition II | 3 | X |
| ENG 1003 | Composition I | 3 | X |  | ENGR 1412 | Software Applications for Engineers | 2 |  |
| ENGR 1402 | Concepts of Engineering | 2 |  |  | ENGR 2421 | Electric Circuits I Lab | 1 |  |
| MATH 2204 | Calculus I | 4 | X |  | ENGR 2423 | Electric Circuits I | 3 |  |
| PHYS 2034 | University Physics I | 4 | X |  | MATH 2214 | Calculus II | 4 | X |
|  |  |  |  |  | PHYS 2044 | University Physics II | 4 |  |
| **Total Hours** |  | 16 |  |  | **Total Hours** |  | 17 |  |
| **Year 2** |  | **Year 2** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| CHEM 1011 | General Chemistry I Lab | 1 | X |  | CS 2114 | Structured Programming | 4 |  |
| CHEM 1013 | General Chemistry I | 3 | X |  | EE 3313 | Electric Circuits II | 3 |  |
| EE 2322 | Electrical Workshop | 2 |  |  | EE 3331 | Digital Electronics I Lab | 1 |  |
| ENGR 2401 | Applied Engineering Statistics | 1 |  |  | EE 3333 | Digital Electronics I | 3 |  |
| ENGR 2403 | Statics | 3 |  |  | ENGR 3443 | Engineering Thermodynamics I | 3 |  |
| MATH 3254 | Calculus III | 4 | X |  | MATH 4403 | Differential Equations | 3 |  |
|  | +++ Humanities Elective | 3 | X |  |  |  |  |  |
| **Total Hours** |  | 17 |  |  | **Total Hours** |  | 17 |  |
| **Year 3** |  | **Year 3** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| EE 3353 | Signals and Systems | 3 |  |  | ENGR 3433 | Engineering Economics | 3 |  |
| EE 3401 | Electronics I Lab | 1 |  |  |  | + Engineering Elective | 3 |  |
| EE 3403 | Electronics I | 3 |  |  |  | + Engineering Elective | 3 |  |
| ENGR 4453 | Numerical Methods for Engineers | 3 |  |  |  | + Engineering Elective | 3 |  |
|  | ++ EE Elective | 3 |  |  |  | + Engineering Elective | 3 |  |
|  | ++ EE Elective | 3 |  |  |  |  |  |  |
| **Total Hours** |  | 16 |  |  | **Total Hours** |  | 15 |  |
| **Year 4** |  | **Year 4** |
| **Fall Semester** |  | **Spring Semester** |
| **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |  | **Course No.** | **Course Name** | **Hrs** | **Gen Ed** |
| EE 4313 | Control Systems Theory | 3 |  |  | ENGR 4482 | Senior Design II | 2 |  |
| EE 4353 | Power Systems | 3 |  |  |  | + Engineering Elective | 3 |  |
| ENGR 4401 | Senior Seminar | 1 |  |  |  | + Engineering Elective | 3 |  |
| ENGR 4463 | Senior Design I | 3 |  |  |  | + Engineering Elective | 3 |  |
|  | ++++ Professional Development Elective | 3 |  |  |  | +++ Fine Arts Elective | 3 | X |
|  | +++ Social Science Elective | 3 | X |  |  |  |  |  |
| **Total Hours** |  | 16 |  |  | **Total Hours** |  | 14 |  |
| **Total Jr/Sr Hours 63 Total Degree Hours 128** |
| + Any EE, ENGR, ESE, ME or MSE course. Maximum 6 credits from lower-level courses.++ Upper-level Electrical Engineering courses.+++ See General Education Requirements for Engineering.++++ Approved Professional Development Elective. Advisor approval required. |

**Bulletin Changes**

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| **Instructions**  |
| **Please visit** [**http://www.astate.edu/a/registrar/students/bulletins/index.dot**](http://www.astate.edu/a/registrar/students/bulletins/index.dot) **and select the most recent version of the bulletin. Copy and paste all bulletin pages this proposal affects below. Please include a before (with changed areas highlighted) and after of all affected sections.** **\*Please note: Courses are often listed in multiple sections of the bulletin. To ensure that all affected sections have been located, please search the bulletin (ctrl+F) for the appropriate courses before submission of this form.**  |

**From the 2021-2022 undergraduate catalog**

**From Page 71**

**Before:**

Special Education

World Languages and Cultures (emphasis in):

—French

—Spanish

**Bachelor of Science in Electrical Engineering (B.S.E.E.)**

Electrical Engineering

**Bachelor of Science in Mechanical Engineering (B.S.M.E.)**

Mechanical Engineering

**After:**

Special Education

World Languages and Cultures (emphasis in):

—French

—Spanish

**Bachelor of Science in Electrical Engineering (B.S.E.E.)**

Electrical Engineering

**Bachelor of Science**

Electrical Systems Engineering

**Bachelor of Science in Mechanical Engineering (B.S.M.E.)**

Mechanical Engineering

**From Page 87**

**Before:**

**COLLEGE OF ENGINEERING AND COMPUTER SCIENCE**

Department of Computer Science

Program for Civil Engineering

Program for Data Science and Data Analytics

Program for Electrical Engineering

Program for Engineering Management Systems

Program for Mechanical Engineering

Program for Engineering Technology

**After:**

**COLLEGE OF ENGINEERING AND COMPUTER SCIENCE**

Department of Computer Science

Program for Civil Engineering

Program for Data Science and Data Analytics

Program for Electrical Engineering

Program for Electrical Systems Engineering

Program for Engineering Management Systems

Program for Mechanical Engineering

Program for Engineering Technology

**From Page 185**

**Before:**

**College of Engineering and Computer Science**

Professor Abhijit Bhattacharyya, Dean

Associate Professor Yeonsang Hwang, Associate Dean

**PROGRAMS OF STUDY**

 The College of Engineering and Computer Science offers undergraduate degree programs in a

broad spectrum of areas, including a Bachelor of Arts and a Bachelor of Science in Computer Science;

a Bachelor of Science in Civil Engineering degree; a Bachelor of Science in Data Science and Data

Analytics; a Bachelor of Science in Electrical Engineering degree; a Bachelor of Science in Engineering

Management Systems; a Bachelor of Science and an Associate of Science in Engineering Technology a

Bachelor of Science and Associate of Applied Science in Land Surveying and Geomatics; and a Bachelor

of Science in Mechanical Engineering degree. Minors are available in Computer Science, Electrical

Engineering, Land Surveying and Geomatics, and Renewable Energy Technology. Two undergraduate

certificates in Data Analytics and Controls and Automation are also available.

 The College of Engineering and Computer Science grants a wide-range of master’s degree programs

(M.E.M., M.S., M.S.E., M.S.Engr.) and multiple graduate certificates. For further information, see

A-State’s Graduate Bulletin.

 From an administrative standpoint, the college is comprised of one department and five programs:

 Department of Computer Science

 Program for Civil Engineering

 Program for Electrical Engineering

 Program for Engineering Management Systems

 Program for Engineering Technology

 Program for Mechanical Engineering

**After:**

**College of Engineering and Computer Science**

Professor Abhijit Bhattacharyya, Dean

Associate Professor Yeonsang Hwang, Associate Dean

**PROGRAMS OF STUDY**

 The College of Engineering and Computer Science offers undergraduate degree programs in a

broad spectrum of areas, including a Bachelor of Arts and a Bachelor of Science in Computer Science;

a Bachelor of Science in Civil Engineering degree; a Bachelor of Science in Data Science and Data

Analytics; a Bachelor of Science in Electrical Engineering degree; a Bachelor of Science in Engineering

Management Systems; a Bachelor of Science and an Associate of Science in Engineering Technology a

Bachelor of Science and Associate of Applied Science in Land Surveying and Geomatics; and a Bachelor

of Science in Mechanical Engineering degree. Minors are available in Computer Science, Electrical

Engineering, Land Surveying and Geomatics, and Renewable Energy Technology. Two undergraduate

certificates in Data Analytics and Controls and Automation are also available. Furthermore, the College

offers a Bachelor of Science in Electrical Systems Engineering and a Bachelor of Science in Mechanical

Systems Engineering at the campus Queretaro in Mexico.

 The College of Engineering and Computer Science grants a wide-range of master’s degree programs

(M.E.M., M.S., M.S.E., M.S.Engr.) and multiple graduate certificates. For further information, see

A-State’s Graduate Bulletin.

 From an administrative standpoint, the college is comprised of one department and seven programs:

 Department of Computer Science

 Program for Civil Engineering

 Program for Electrical Engineering

 Program for Electrical Systems Engineering

 Program for Engineering Management Systems

 Program for Engineering Technology

 Program for Mechanical Engineering

 Program for Mechanical Systems Engineering

**After Page 206 and before the heading on “Mechanical Engineering Program” (pg. 207).
(Before: N/A (this section is new)).**

**After:**

Electrical Systems Engineering Program

**Associate Professor:** *Possani*

**Instructors:** *Martinez, Aguilar, Ulin, Porta*

In the Bachelor of Science in Electrical Systems Engineering (BSESE) program at A-State campus Queretaro, students combine circuit design, electronics, embedded devices, smart energy technology and control systems with state-of-the-art computational methods to analyze, innovate, design, implement and operate complex engineering systems which are economical, reliable, efficient, and sustainable. This flexible program allows students to choose from a wide range of electives to create a unique experience. Students can choose from specialized focuses such as Telecommunications, Energy Production and Distribution, Mechatronics, or select a different set of electives.

**PROGRAM EDUCATIONAL OBJECTIVES**

The Electrical Systems Engineering Program has a mechanism in place to periodically assess its effective­ness in meeting its educational objectives and outcomes (see below). This assessment process results in periodic modification to specific courses and the overall degree plan so as to better promote the achievement of the objectives and outcomes, themselves periodically formulated and revised, with the assistance of the Electrical Systems Engineering Advisory Council, in relation to the evolving mission and resource base of the Program. This occurs within the context of the evolving needs of the region and nation and the current state-of-the profession. The specific educational objectives of the BSESE degree program are:

1. Graduates have successfully advanced in electrical/computer engineering or related relevant practice as evidenced by contributions to their employers and the greater professional community.
2. Graduates have pursued graduate degrees or completed professional development ac­tivities in continuing to advance their knowledge base in electrical systems engineering or related professional fields.
3. Graduates have made a broader contribution by providing an engineering or otherwise technical or objective perspective to the challenges and opportunities of society.

The Electrical Systems Engineering Program’s outcomes define the knowledge, skills, attitudes, and behaviors that program graduates are expected to have by the time of graduation from the Program. Graduates of the Electrical Systems Engineering Program will have:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics;
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environ­mental, and economic factors;
3. An ability to communicate effectively with a range of audiences;
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts;
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives;
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions; and
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

**Major in Electrical Systems Engineering**

**Bachelor of Science**

A complete 8-semester degree plan is available at https://www.astate.edu/info/academics/degrees/

|  |
| --- |
| **University Requirements:**  |
| See University General Requirements for Baccalaureate degrees (p. 47)  |
| **First Year Making Connections Course:**  | **Sem. Hrs.**  |
| ENGR 1402, Concepts of Engineering (See Engineering Core Courses)  | **-**  |
| **General Education Requirements:**  | **Sem. Hrs.**  |
| See General Education Curriculum for Engineering  | **38**  |
| **Engineering Core Courses:**  | **Sem. Hrs.**  |
| Refer to Engineering Core Courses  | **20**  |
| **Major Requirements:** Electives denoted with an asterisk (\*) may be selected from any courses within the desig­nated elective group; subject to a program advisor’s approval. They must make a rational contribution to the student’s personal and professional education goals. In addition to the University requirements for all Baccalaureate Degrees, a Bachelor of Science in Electrical Systems Engineering requires that one of the two following conditions be met: 1. “C” or better in each course in the major courses; **OR** 2. 2.5 (or greater) grade point average in the major courses listed below.  | **Sem. Hrs.**  |
| CS 2114, Structured Programming  | 4  |
| EE 2322, Electrical Workshop  | 2  |
| EE 3313, Electric Circuits II  | 3  |
| EE 3331, Digital Electronics I Lab  | 1  |
| EE 3333, Digital Electronics I  | 3  |
| EE 3353, Signals and Systems  | 3  |
| EE 3401, Electronics I Laboratory  | 1  |
| EE 3403, Electronics I  | 3  |
| EE 4313, Control Systems Theory  | 3  |
| EE 4353, Power Systems  | 3  |
| ENGR 2423 **AND** ENGR 2421, Electric Circuits I and Laboratory  | 4  |
| ENGR 3443, Engineering Thermodynamics I  | 3  |
| \* Electrical Engineering Electives (upper level, EE prefix) | 6  |
| \* Engineering Electives (maximum 6 hrs lower level, EE or ENGR or ESE or ME or MSE prefix) | 21 |
| \* Professional Development Elective (Advisor approval required)*This elective may be selected outside the Engineering Programs, subject only to the following list or advisor’s approval. It must make a rational contribution to the student’s personal and professional education goals. Pre-approved Professional Development Electives:*CHEM 1023, General Chemistry IIEE 4343, Digital Signal ProcessingENGR 2413, Mechanics of MaterialsENGR 3423, DynamicsENGR 3473, Fluid MechanicsMATH 3243, Linear AlgebraMATH 3323, Mathematical Modeling | 3  |
| **Sub-total**  | 63 |
| **Additional Support Courses:**  | **Sem. Hrs.**  |
| MATH 4403, Differential Equations  | **3**  |
| PHYS 2044, University Physics II  | 4  |
| **Total Required Hours:**  | **128** |

**Page 516, before the heading “Finance (FIN)”**

**Before:**

**ES 4843. Practicum/Pre-Internship** Introduction to field experience in exercise science in

order to become familiar with the operational and procedural aspects of clinically based exercise

facilities. Prerequisite, grade of “C” or better in ES 3653, ES 3713, ES 4683, and ES 4693, or

instructor permission. Corequisite, ES 4673. Spring.

**Finance (FIN)**

**FIN 2013. Personal Asset Management** Financial assets as vehicles for saving for the future,

investments in combinations of assets to meet financial objectives, and how the financial objectives

will change over the life span of the investor. Fall, Spring

**After:**

**ES 4843. Practicum/Pre-Internship** Introduction to field experience in exercise science in

order to become familiar with the operational and procedural aspects of clinically based exercise

facilities. Prerequisite, grade of “C” or better in ES 3653, ES 3713, ES 4683, and ES 4693, or

instructor permission. Corequisite, ES 4673. Spring.

**Electrical Systems Engineering (ESE)**

**ESE 3003. Introduction to Energy Systems** Fundamental principles and applications related to traditional, modern, and alternative energy systems. Prerequisite, C or better in ENGR 3443. Fall, Spring

**ESE 4003. Energy Systems I** Multidisciplinary group work on solving engineering problems related to energy systems. Emphasis on the identification and analysis of problems in existing energy systems. Prerequisite, C or better in ESE 3003. Fall

**ESE 4013. Energy Systems II** Multidisciplinary group work on solving complex engineering problems related to energy systems. Emphasis on the design and improvement of energy systems. Prerequisite, C or better in ESE 4003. Spring

**Finance (FIN)**

**FIN 2013. Personal Asset Management** Financial assets as vehicles for saving for the future,

investments in combinations of assets to meet financial objectives, and how the financial objectives

will change over the life span of the investor. Fall, Spring