Mission / Purpose

Vision: The Department of Electrical and Computer Engineering will be a nationally recognized leader in student-centered education, research, and innovation. Mission: The mission of the Department of Electrical and Computer Engineering is to serve the state, nation, and global community by advancing the boundaries of knowledge through innovative research and education of the next generation of leaders.

Goals

G 1: Distinguished Graduates
We will provide high-quality experiences that educate distinguished bachelors, masters, and doctoral graduates.

G 2: Innovative Research
We will develop, conduct, and disseminate innovative research that engages students at all levels.

G 3: Faculty Dedication
We will foster faculty dedication to excellence in education, research, and service.

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 4: Graduates shall demonstrate advanced knowledge of topics in electrical and computer engineering
(Discipline Knowledge) Graduates shall demonstrate advanced knowledge of topics in their chosen major specialization area in electrical and computer engineering.

Related Measures

M 8: Direct, course embedded assessments with a focus on advanced topics in material and devices
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

M 9: Direct, course embedded assessments with a focus on advanced topics in embedded systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

M 10: Direct, course embedded assessments with a focus on advanced topics in electromechanical systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

M 11: Thesis (Plan I) or manuscript submission (Plan II)
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

Target:
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

SLO 5: Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering
(Skills/Abilities) Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering including complex problem solving, analytical reasoning, fundamental research and communication.

Related Measures

Connected Document

electrical engineering Curriculum Maps
Related Measures

M 11: Thesis (Plan I) or manuscript submission (Plan II)
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

Target:
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

M 12: Direct, course embedded assessments with a focus on advanced skills and/or abilities in devices and materials
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

M 13: Direct, course embedded assessments with a focus on advanced skills and/or abilities in embedded systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

M 14: Direct, course embedded assessments with a focus on advanced skills and/or abilities in electromechanical systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

SLO 6: An Improvement Outcome Derived from the 2010/11 Assessment Findings
(An Improvement Outcome Derived from the 2010/11 Assessment Findings) Implementation of direct, course embedded assessments.

Connected Document electrical engineering Curriculum Maps

Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 1: The program will improve and sustain a high level of recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Document electrical engineering Curriculum Maps

Related Measures

M 1: Program Outcome 1: Measure 1.1
The department will offer at least one opportunity each year to advance capabilities of current faculty through training and instructional programs addressing graduate teaching effectiveness. Accordingly, ECE faculty will average 4.0/5.0 on UA student opinion of instruction surveys.

Source of Evidence: Student course evaluations on learning gains made

Target:
The departmental target for SOI results for instructor rating by all graduate students is 4.00/5.00.

M 2: Program Outcome 1: Measure 1.2
By the year 2020, the department will have external contract and grant expenditures of over $3.5 million/year engaging MS students in that research. The goal is a linear increase each year from the current expenditure level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
To reach the departmental goal, considering new awards, by 2020, the new awards total increase each year must be $116,250. Thus, the target for 2012-2013 is $2.69M.

M 3: Program Outcome 1: Measure 1.3
By the year 2020, the department will have scholarly activities including three refereed journal publications per faculty per year engaging MS students in those activities. The goal is a linear increase each year from the current publication levels until the target is attained.

Source of Evidence: Academic direct measure of learning - other
Target:
The departmental goal for an annual per faculty journal publication rate is 3.00 by 2020.

OthOtcm 2: The program will build and sustain an optimal level of annual program enrollments and degree completion.
The program will build and sustain an optimal level of annual program enrollments and degree completion.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 4: Program Outcome 2: Measure 2.1
By the year 2020, the department will enroll 20 MS students. Enrollment will be measured each fall using university census data. The goal is a linear increase each year from the current enrollment level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
A target of 20 MS students enrolled has been established. Note that fall 2011 enrollment was 21. Fundamentally, the objective is to maintain the present MS enrollment while growing the PhD program.

M 5: Program Outcome 2: Measure 2.2
By the year 2020, the department will produce 5 MS degrees each calendar year. The goal is a linear increase each year from the current graduation level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
5 MS graduates each academic year.

OthOtcm 3: The program will be highly valued by its program graduates and other key constituencies it serves
The program will be highly valued by its program graduates and other key constituencies it serves.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 6: Program Outcome 3: Measure 3.1
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to multiple program quality parameters on an ECE department MS graduate exit survey.

Source of Evidence: Exit interviews with grads/program completers

Target:
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to multiple program quality parameters on an ECE department MS graduate exit survey.

M 7: Program Outcome 3: Measure 3.2
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to post-graduation plans and how the MS program quality impacted those plans on an ECE department MS graduate exit survey.

Source of Evidence: Exit interviews with grads/program completers

Target:
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to post-graduation plans and how the MS program quality impacted those plans on an ECE department MS graduate exit survey.
Mission / Purpose

Vision: The Department of Electrical and Computer Engineering will be a nationally recognized leader in student-centered education, research, and innovation. Mission: The mission of the Department of Electrical and Computer Engineering is to serve the state, nation, and global community by advancing the boundaries of knowledge through innovative research and education of the next generation of leaders.

Goals

G 1: Distinguished Graduates
We will provide high-quality experiences that educate distinguished bachelors, masters, and doctoral graduates.

G 2: Innovative Research
We will develop, conduct, and disseminate innovative research that engages students at all levels.

G 3: Faculty Dedication
We will foster faculty dedication to excellence in education, research, and service.

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 4: Graduates shall demonstrate advanced knowledge of topics in electrical and computer engineering (Discipline Knowledge) Graduates shall demonstrate advanced knowledge of topics in their chosen major specialization area in electrical and computer engineering.

Related Measures

M 8: Direct, course embedded assessments with a focus on advanced topics in material and devices
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 530. Course embedded assessments for 2012-2013 show that student performance for this outcome was 3.80/4.00, thus meeting the target.

M 9: Direct, course embedded assessments with a focus on advanced topics in embedded systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 580. Course embedded assessments for 2012-2013 show that student performance for this outcome was 4.00/4.00, thus meeting the target.

M 10: Direct, course embedded assessments with a focus on advanced topics in electromechanical systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 551. Course embedded assessments for 2012-2013 show that student performance for this outcome was 4.00/4.00, thus meeting the target.
M 11: Thesis (Plan I) or manuscript submission (Plan II)
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

Target:
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Finding (2012-2013) - Target: Met
All MSEEE degree graduates have successfully met the state requirement.

SLO 5: Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering
(Skills/Abilities) Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering including complex problem solving, analytical reasoning, fundamental research and communication.

Connected Document electrical engineering Curriculum Maps

Related Measures

M 11: Thesis (Plan I) or manuscript submission (Plan II)
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

Target:
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Finding (2012-2013) - Target: Met
All MSEEE degree graduates have successfully met the state requirement.

M 12: Direct, course embedded assessments with a focus on advanced skills and/or abilities in devices and materials
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 539. Course embedded assessments for 2012-2013 show that student performance for this outcome was 3.40/4.00, thus meeting the target.

M 13: Direct, course embedded assessments with a focus on advanced skills and/or abilities in embedded systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 586. Course embedded assessments for 2012-2013 show that student performance for this outcome was 3.00/4.00, thus meeting the target.

M 14: Direct, course embedded assessments with a focus on advanced skills and/or abilities in electromechanical systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2012-2013) - Target: Met
This outcome is directly assessed through student performance in ECE 579. Course embedded assessments for 2012-2013 show that student performance for this outcome was 3.46/4.00, thus meeting the target.

SLO 6: An Improvement Outcome Derived from the 2010-11 Assessment Findings
(An Improvement Outcome Derived from the 2010-11 Assessment Findings) Implementation of direct, course embedded assessments.

Connected Document electrical engineering Curriculum Maps

Related Measures

M 15: Implementation of direct, course embedded assessments
Direct course embedded assessments will be performed in 2 classes for each departmental focus area.
Target:
The target is to identify courses in which to assess student performance and actually employ this assessment for the 2012-2013 academic year.

Finding (2012-2013) - Target: Met
The courses were identified by focus area as: embedded systems (ECE 580, 586), devices and materials (ECE 530, 539), and electromechanical systems (ECE 551, 579). Student performance in these classes was used used for other relevant measures.

Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 1: The program will improve and sustain a high level of recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 1: Program Outcome 1: Measure 1.1
The department will offer at least one opportunity each year to advance capabilities of current faculty through training and instructional programs addressing graduate teaching effectiveness. Accordingly, ECE faculty will average 4.0/5.0 on UA student opinion of instruction surveys.

Source of Evidence: Student course evaluations on learning gains made

Target:
The departmental target for SOI results for instructor rating by all graduate students is 4.00/5.00.

Finding (2012-2013) - Target: Met
The 2012-2013 SOI results for the instructor grade SOI question were weighted by number of graduate student respondents in both academic year semesters. The result was 4.44/5.00, which meets the target for this measure.

M 2: Program Outcome 1: Measure 1.2
By the year 2020, the department will have external contract and grant expenditures of over $3.5 million/year engaging MS students in that research. The goal is a linear increase each year from the current expenditure level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
To reach the departmental goal, considering new awards, by 2020, the new awards total increase each year must be $116,250. Thus, the target for 2012-2013 is $2.69M.

Finding (2012-2013) - Target: Partially Met
New awards in ECE for 2012-2013 totaled $1.03M, which falls significantly short of the target value of $2.69M.

M 3: Program Outcome 1: Measure 1.3
By the year 2020, the department will have scholarly activities including three refereed journal publications per faculty per year engaging MS students in those activities. The goal is a linear increase each year from the current publication levels until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
The departmental goal for an annual per faculty journal publication rate is 3.00 by 2020.

Finding (2012-2013) - Target: Met
The per-faculty, per-year journal publication rate for 2012-2013 was 5.56, which exceeds the 2020 goal.

OthOtcm 2: The program will build and sustain an optimal level of annual program enrollments and degree completion
The program will build and sustain an optimal level of annual program enrollments and degree completion.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 4: Program Outcome 2: Measure 2.1
By the year 2020, the department will enroll 20 MS students. Enrollment will be measured each fall using university census data. The goal is a linear increase each year from the current enrollment level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
A target of 20 MS students enrolled has been established. Note that fall 2011 enrollment was 21. Fundamentally, the objective is to maintain the present MS enrollment while growing the PhD program.

Finding (2012-2013) - Target: Met
Fall 2012 MS enrollment was 16, which is considered within the range of acceptable since the graduate focus is on the PhD program.

M 5: Program Outcome 2: Measure 2.2
By the year 2020, the department will produce 5 MS degrees each calendar year. The goal is a linear increase each year from the current graduation level until the target is attained.

Source of Evidence: Academic direct measure of learning - other

Target:
5 MS graduates each academic year.

Finding (2012-2013) - Target: Met
For the 2012-2013 academic year, the ECE department produced 15 MS graduates. This far exceeds our target, which indicates a prior focus on the MS program.

**OthOtcm 3: The program will be highly valued by its program graduates and other key constituencies it serves**

The program will be highly valued by its program graduates and other key constituencies it serves.

**Connected Document**

[electrical engineering Curriculum Maps](#)

**Related Measures**

**M 6: Program Outcome 3: Measure 3.1**

80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to multiple program quality parameters on an ECE department MS graduate exit survey.

- **Source of Evidence:** Exit interviews with grads/program completers

- **Target:**
  80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to multiple program quality parameters on an ECE department MS graduate exit survey.

- **Finding (2012-2013) - Target: Not Reported This Cycle**
  The MS graduate exit survey has not been implemented. Thus, this measure is unable to be assessed.

**M 7: Program Outcome 3: Measure 3.2**

80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to post-graduation plans and how the MS program quality impacted those plans on an ECE department MS graduate exit survey.

- **Source of Evidence:** Exit interviews with grads/program completers

- **Target:**
  80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to post-graduation plans and how the MS program quality impacted those plans on an ECE department MS graduate exit survey.

- **Finding (2012-2013) - Target: Not Reported This Cycle**
  The MS graduate exit survey has not been implemented. Thus, this measure is unable to be assessed.

**Details of Action Plans for This Cycle (by Established cycle, then alpha)**

**Improvements for instruction in advanced topics in the embedded systems focus area**

Additional lecture time and assignments need to focus on students' ability to master advanced topics in the embedded systems focus area. Specifically, additional lecture material on developing a process to solve an advanced, practical engineering problem will be presented in ECE580.

- **Established in Cycle:** 2011-2012
- **Implementation Status:** Finished
- **Priority:** Medium

**Relationships (Measure | Outcome/Objective):**

- **Measure:** Direct, course embedded assessments with a focus on advanced topics in embedded systems
- **Outcome/Objective:** Graduates shall demonstrate advanced knowledge of topics in electrical and computer engineering

**Responsible Person/Group:** Embedded systems faculty.
Mission / Purpose

Vision: The Department of Electrical and Computer Engineering will be a nationally recognized leader in student-centered education, research, and innovation. Mission: The mission of the Department of Electrical and Computer Engineering is to serve the state, nation, and global community by advancing the boundaries of knowledge through innovative research and education of the next generation of leaders.

Student Learning Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

SLO 4: Graduates shall demonstrate advanced knowledge of topics in electrical and computer engineering (Discipline Knowledge)
Graduates shall demonstrate advanced knowledge of topics in their chosen major specialization area in electrical and computer engineering.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 8: Direct, course embedded assessments with a focus on advanced topics in material and devices
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2011-2012) - Target: Met
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 3.50/4.00 in ECE539 and 3.30/4.00 in ECE566. The target for this assessment was met. No substantial changes in course instruction or assessment are anticipated for the upcoming reporting cycle.

M 9: Direct, course embedded assessments with a focus on advanced topics in embedded systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2011-2012) - Target: Partially Met
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 2.80/4.00 in ECE580 and 3.00/4.00 in ECE586. The target for this assessment was met in ECE586. No substantial changes in course instruction or assessment are anticipated in ECE586 for the upcoming reporting cycle.

Related Action Plans (by Established cycle, then alpha):
For full information, see the Details of Action Plans section of this report.

Improvements for instruction in advanced topics in the embedded systems focus area
Established in Cycle: 2011-2012
Additional lecture time and assignments need to focus on students' ability to master advanced topics in the embedded systems foc...

M 10: Direct, course embedded assessments with a focus on advanced topics in electromechanical systems
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

Target:
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

Finding (2011-2012) - Target: Met
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 4.00/4.00 in ECE551 and 3.20/4.00 in ECE579. The target for this assessment was met. No substantial changes in course instruction or assessment are anticipated for the upcoming reporting cycle.

M 11: Thesis (Plan I) or manuscript submission (Plan II)
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

**Target:**
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

**Finding (2011-2012) - Target: Met**
All MSEE graduates successfully met either the thesis (Plan I) or manuscript submission (Plan II) requirement.

**SLO 5:** Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering (Skills/Abilities) Graduates shall demonstrate advanced skills and abilities in electrical and computer engineering including complex problem solving, analytical reasoning, fundamental research and communication.

**Connected Document**
electrical engineering Curriculum Maps

**Related Measures**

**M 11: Thesis (Plan I) or manuscript submission (Plan II)**
Graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

Source of Evidence: Senior thesis or culminating major project

**Target:**
100% of graduates will have independently researched a topic and produced a thesis (Plan I) or submitted a refereed journal or conference manuscript (Plan II) that has been peer reviewed and accepted by a graduate advisory committee consisting of at least three graduate faculty members in the area of the research specialization.

**Finding (2011-2012) - Target: Met**
All MSEE degree graduates have successfully met the state requirement.

**M 12: Direct, course embedded assessments with a focus on advanced skills and/or abilities in devices and materials**
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

**Target:**
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

**Finding (2011-2012) - Target: Met**
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 3.67/4.00 in ECE539 and 3.76/4.00 in ECE566. The target for this assessment was met. No substantial changes in course instruction or assessment are anticipated for the upcoming reporting cycle.

**M 13: Direct, course embedded assessments with a focus on advanced skills and/or abilities in embedded systems**
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

**Target:**
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

**Finding (2011-2012) - Target: Met**
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 3.72/4.00 in ECE580 and 3.00/4.00 in ECE586. The target for this assessment was met in ECE586. No substantial changes in course instruction or assessment are anticipated in ECE586 for the upcoming reporting cycle.

**M 14: Direct, course embedded assessments with a focus on advanced skills and/or abilities in electromechanical systems**
Direct assessment of this student learning outcome will be made through multiple course embedded assessments as indicated on the ECE graduate curriculum map.

Source of Evidence: Academic direct measure of learning - other

**Target:**
For students passing the courses with embedded assessments for this outcome, the department average for these assessments will be 3.0/4.0 or above using a department standard assessment rubric.

**Finding (2011-2012) - Target: Met**
Assessments of this outcome include 2 unique assessments across 2 course offerings including courses as shown in the attached course embedded assessment curriculum maps. Course embedded assessments for 2011-2012 show that student performance for this outcome was 3.80/4.00 in ECE551 and 3.40/4.00 in ECE579. The target for this assessment was met. No substantial changes in course instruction or assessment are anticipated for the upcoming reporting cycle.

**SLO 6: An Improvement Outcome Derived from the 2010-11 Assessment Findings**
(An Improvement Outcome Derived from the 2010-11 Assessment Findings) Implementation of direct, course embedded assessments.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 15: Implementation of direct, course embedded assessments
Implementation of direct, course embedded assessments measuring both knowledge of advanced topics and skills/abilities in focus courses in material and devices, electromechanical systems, and embedded systems.
Source of Evidence: Academic direct measure of learning - other

Target:
Six courses including MSEE students (two in each of the three focus areas including devices/materials, embedded systems, and electromechanical systems) were selected for including direct course embedded assessments of advanced knowledge and skills/abilities.

Finding (2011-2012) - Target: Met
All six courses included new MSEE graduate level embedded course assessments.

Other Outcomes, with Any Associations and Related Measures, Targets, Findings, and Action Plans

OthOtcm 1: The program will improve and sustain a high level of recognized quality
The program will improve and sustain a high level of recognized quality.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 1: Program Outcome 1: Measure 1.1
The department will offer at least one opportunity each year to advance capabilities of current faculty through training and instructional programs addressing graduate teaching effectiveness. Accordingly, ECE faculty will average 4.0/5.0 on UA student opinion of instruction surveys.
Source of Evidence: Student course evaluations on learning gains made

M 2: Program Outcome 1: Measure 1.2
By the year 2020, the department will have external contract and grant expenditures of over $3.5 million/year engaging MS students in that research. The goal is a linear increase each year from the current expenditure level until the target is attained.
Source of Evidence: Academic direct measure of learning - other

M 3: Program Outcome 1: Measure 1.3
By the year 2020, the department will have scholarly activities including three refereed journal publications per faculty per year engaging MS students in those activities. The goal is a linear increase each year from the current publication levels until the target is attained.
Source of Evidence: Academic direct measure of learning - other

OthOtcm 2: The program will build and sustain an optimal level of annual program enrollments and degree completion
The program will build and sustain an optimal level of annual program enrollments and degree completion.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 4: Program Outcome 2: Measure 2.1
By the year 2020, the department will enroll 20 MS students. Enrollment will be measured each fall using university census data. The goal is a linear increase each year from the current enrollment level until the target is attained.
Source of Evidence: Academic direct measure of learning - other

M 5: Program Outcome 2: Measure 2.2
By the year 2020, the department will produce 5 MS degrees each calendar year. The goal is a linear increase each year from the current graduation level until the target is attained.
Source of Evidence: Academic direct measure of learning - other

OthOtcm 3: The program will be highly valued by its program graduates and other key constituencies it serves
The program will be highly valued by its program graduates and other key constituencies it serves.

Connected Document
electrical engineering Curriculum Maps

Related Measures

M 6: Program Outcome 3: Measure 3.1
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to multiple program quality parameters on an ECE department MS graduate exit survey.
Source of Evidence: Exit interviews with grads/program completers

M 7: Program Outcome 3: Measure 3.2
80% of students will report an average of 3.0/4.0 or greater for relevant questions directly relating to post-graduation plans and how the MS program quality impacted those plans on an ECE department MS graduate exit survey.
Source of Evidence: Exit interviews with grads/program completers
Details of Action Plans for This Cycle (by Established cycle, then alpha)

**Improvements for instruction in advanced topics in the embedded systems focus area**

Additional lecture time and assignments need to focus on students' ability to master advanced topics in the embedded systems focus area. Specifically, additional lecture material on developing a process to solve an advanced, practical engineering problem will be presented in ECE580.

**Established in Cycle:** 2011-2012  
**Implementation Status:** Planned  
**Priority:** Medium

**Relationships (Measure | Outcome/Objective):**
- **Measure:** Direct, course embedded assessments with a focus on advanced topics in embedded systems  
- **Outcome/Objective:** Graduates shall demonstrate advanced knowledge of topics in electrical and computer engineering

**Responsible Person/Group:** Embedded systems faculty.