

**Department of Engineering Technology  
Strategic Plan  
2009-2010**

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# 1. Mission Statements

## ***Northwestern State University Mission***

Northwestern State University is a responsive, student-oriented institution that is committed to the creation, dissemination, and acquisition of knowledge through teaching, research, and service. The University maintains as its highest priority excellence in teaching in graduate and undergraduate programs. Northwestern State University prepares its students to become productive members of society and promotes economic development and improvements in the quality of life of the citizens in its region.

## ***Academic Affairs Mission***

The Office of Academic Affairs creates, supports, and enhances a student-centered academic environment which frames the University's mission and vision. It is the center for all academic endeavors at Northwestern State University. Academic Affairs, under the direction of the Provost/Vice-President, provides leadership for articulating academic goals, sets the overall academic direction, and operationalizes the President's vision for the future of the University. It facilitates the establishment of programs, policies, procedures, and standards for the selection, evaluation, and development of faculty and staff and for the review of academic programs in accomplishing the University's mission and academic goals. Academic Affairs coordinates the University's various colleges, programs, and services to maintain a coherent institutional perspective and ensure that the needs and character of individual programs are addressed within the institutional framework.

## ***College of Science & Technology Mission***

The mission of the College of Science and Technology parallels the mission of the University. The College of Science and Technology is committed to maintaining quality undergraduate and graduate curricula. Course offerings in the sciences and technologies are designed to satisfy the requirements of the offered curricula, of the core curriculum, and of special requirements from other curricula and programs. Excellence in teaching is the lofty goal of each faculty member in the College of Science and Technology. Research and scholarly activities are encouraged as a means of enhancing teaching and keeping curricula and course offerings fresh and current. Faculty recognize the importance of the interaction between themselves and the students as a vital link in the learning process. The sphere of influence of the College of Science and Technology reaches far beyond the University. Faculty provide consultation services to regional industry, participate in community service activities, and generate research that will benefit economic development and quality of life in the region.

## ***Department of Engineering Technology Mission***

The mission of the Department of Engineering Technology is to produce two-year and four-year graduates with the breadth and depth of knowledge in engineering technology to become lifelong productive members of the regional workforce and the local society.

## 2. University Goals and Unit Objectives

### *NSU Goal 1: To create and maintain a responsive, student-oriented environment*

*Objective: Identify and support programs and services responsive to the needs of the service area and student clientele.*

#### **Academic Affairs Objectives**

1. Provide coordination to enhance student services activities
2. Develop procedures to collect and analyze data about student services

#### **College of S&T Objectives**

1. Insure that classrooms, buildings, laboratories including all laboratory equipment, and other learning facilities are clean, in good working order and that laboratories are in compliance with safety standards and regulations
2. Provide lines of communication to insure one on one interaction between faculty and students

#### **Engineering Tech Objectives**

1. To plan and complete the renovation of Williamson Hall
2. To increase the effectiveness of academic advising in the ET Department

### *NSU Goal 2: To provide programs, services, and operations throughout the University of high quality and effectiveness*

*Objective: Evaluate and respond to the changing environment to assure student learning and development.*

#### **Academic Affairs Objectives**

1. Promote faculty excellence in teaching, research, and service
2. Maintain fully accredited programs

#### **College of S&T Objectives**

1. To provide students with programs of study which are fresh, innovative and will enhance critical thinking and problem-solving skills
2. Embed technology in all programs of study

#### **Engineering Tech Objectives**

1. To improve the overall quality and effectiveness of all programs in the ET Department
2. To produce graduates who are knowledgeable and skilled in their disciplines.

***NSU Goal 3: To enhance institutional viability through effective enrollment management***

*Objective (recruitment): To increase the enrollment of new students who inquire about attending the institution*

*Objective (retention): To increase the overall persistence rate for full-time, degree-seeking undergraduate students*

**Academic Affairs Objectives**

1. Implement the board approved retention plan
2. Implement the board approved enrollment plan

**College of S&T Objectives**

1. To increase enrollment in the College
2. To increase retention in the College

**Engineering Tech Objectives**

1. To increase the enrollment of high academic achievers
2. To increase retention and graduation rates of ET students

***NSU Goal 4: To promote economic development, community service, and an improved quality of life in the region***

*Objective: Provide support for economic and cultural development through community outreach*

**Academic Affairs Objectives**

1. Promote regional partnerships with business and industry
2. Expand regional service opportunities

**College of S&T Objectives**

1. Generate activities that involve the faculty, students, and the community
2. Encourage faculty to develop grants and activities that support economic development

**Engineering Tech Objectives**

1. To increase retention and graduation rates of ET students
2. To develop and maintain industrial partnerships

### 3. Engineering Technology Strategic Plan

*NSU Goal 1: To create and maintain a responsive, student-oriented environment*

*Objective: Identify and support programs and services responsive to the needs of the service area and student clientele*

<u>ET Objectives</u>	<u>Strategies</u>	<u>Assessment Methodologies</u>	<u>Assessment Targets</u>	<u>Assessment Results</u>	<u>Continuous Improvement</u>
1. To plan and complete the renovation of Williamson Hall	<ul style="list-style-type: none"> <li>• Complete ordering of furniture/equipment</li> <li>• Complete the move back to Wm Hall</li> <li>• Prepare for spring classes in Wm Hall</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> </ul>	<ul style="list-style-type: none"> <li>• Wm Hall is occupied and classes begin in Spring 2009</li> </ul>	•	•
2. To increase the effectiveness of academic advising in the ET Department	<ul style="list-style-type: none"> <li>• Increase the satisfaction with student advising in the department</li> <li>• Appoint and train a transfer advisor</li> </ul>	<ul style="list-style-type: none"> <li>• Graduating Student Survey questions 85, 86, and 87</li> </ul>	<ul style="list-style-type: none"> <li>• Satisfaction with academic advising <math>\geq 3.75</math> out of 5</li> </ul>		•
3. To expand the ET programs in Norwest Louisiana	<ul style="list-style-type: none"> <li>• Offer courses in Alex</li> <li>• Offer courses in SHV</li> <li>• Partner with BPCC</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> </ul>	<ul style="list-style-type: none"> <li>• At least one course offered in Alexandria</li> <li>• At least one course offered in conjunction with BPCC</li> </ul>		

**NSU Goal 2: To provide programs, services, and operations throughout the University of high quality and effectiveness**

*Objective: Evaluate and respond to the changing environment to assure student learning and development*

<u>ET Objectives</u>	<u>Strategies</u>	<u>Assessment Methodologies</u>	<u>Assessment Targets</u>	<u>Assessment Results</u>	<u>Continuous Improvement</u>
1. To improve the overall quality and effectiveness of all programs in the ET Department	<ul style="list-style-type: none"> <li>Assess and evaluate program educational objectives and program expected learning outcomes in preparation for ABET accreditation</li> <li>Continually assess and evaluate course objectives to meet all program expected learning outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Employer surveys</li> <li>Alumni surveys</li> <li>Annual ELO assessment</li> </ul>	<ul style="list-style-type: none"> <li>80% of alumni report <math>\geq 4</math> of 7 on their overall satisfaction with career development on the alumni survey</li> <li>80% of employers report at least 4 of 7 on their overall satisfaction with the career development of graduates on the employer survey</li> <li>Targets for program outcomes are met</li> </ul>	•	•
2. To produce graduates who are knowledgeable and skilled in their disciplines. Within a few years after graduation, graduates should:	<p>Program Educational Objectives (PEO)-<sup>1</sup></p> <ol style="list-style-type: none"> <li>Demonstrate technical proficiency in the field</li> <li>Be innovative or apply quantitative reasoning and critical thinking in solving technical problems</li> <li>Effectively communicate technical knowledge, ideas, and proposals to others</li> <li>Participate in or lead project teams in successful completion of projects</li> <li>Understand company products/services (EET) or have strong management skills (IET)</li> </ol>	<ul style="list-style-type: none"> <li>Merge the assessments of linked program expected learning outcomes linked to PEO (see paragraph 4)</li> <li>Alumni surveys</li> <li>Employer surveys</li> </ul>	<ul style="list-style-type: none"> <li>Targets for related program outcomes are met</li> <li>80% of alumni report <math>\geq 4</math> of 7 on these strategies on the alumni survey</li> <li>80% of employers report at least 4 of 7 on these strategies on the employer survey</li> </ul>	•	•

<sup>1</sup> The strategies for ET Objective 2 of Goal 2 are the Program Educational Objectives for each degree program listed in [Paragraph 4](#) of this document. Refer to [Paragraph 4](#) for the complete listings and the links to Expected Learning Outcomes.

**NSU Goal 3: To enhance institutional viability through effective enrollment management**

*Objective (recruitment): To increase the enrollment of new students who inquire about attending the institution*

*Objective (retention): To increase the overall persistence rate for full-time, degree-seeking undergraduate students*

<u>ET Objectives</u>	<u>Strategies</u>	<u>Assessment Methodologies</u>	<u>Assessment Targets</u>	<u>Assessment Results</u>	<u>Continuous Improvement</u>
1. To increase the enrollment of high academic achievers	<ul style="list-style-type: none"> <li>Maintain status as a Area of Excellence</li> <li>Vigorously pursue Project Lead the Way in Louisiana</li> </ul>	<ul style="list-style-type: none"> <li>Average ACT scores of applicants and new freshmen show an increasing trend</li> <li>Enrollments in 4-year programs increase year over year</li> <li>Increase participation in PLTW of school districts in Louisiana</li> </ul>	<ul style="list-style-type: none"> <li>Area of Excellence designation is maintained</li> <li>Average ACT scores increase by 0.1 per year</li> <li>1.5% average increase in 4-year program enrollment based on fall 14-day count</li> <li>Get at least five school districts involved in PLTW during 08-09</li> </ul>	•	•
2. To increase retention and graduation rates of ET students	<ul style="list-style-type: none"> <li>Improve academic advising (see Goal 1 also)</li> <li>Identify and train a transfer advisor</li> <li>Participate in the call back program</li> </ul>	<ul style="list-style-type: none"> <li>Retention of first time, full time freshmen from fall to fall</li> <li>First time, full time freshmen graduate within 6 years</li> </ul>	<ul style="list-style-type: none"> <li>Persistence rates of FTFT EFR have increased to 50% by 2008</li> <li>Persistence rates of ET students have increased to 75% by 2008</li> <li>Graduations of ET students have increased by 10% by 2008</li> </ul>	•	•

**NSU Goal 4: To promote economic development, community service, and an improved quality of life in the region**

*Objective: Provide support for economic and cultural development through community outreach.*

<u>ET Objectives</u>	<u>Strategies</u>	<u>Assessment Methodologies</u>	<u>Assessment Targets</u>	<u>Assessment Results</u>	<u>Continuous Improvement</u>
1. To increase retention and graduation rates of technology students who will be entering the local/regional workforce	<ul style="list-style-type: none"> <li>• Improve academic advising (see Goal 1 also)</li> <li>• Install a transfer advisor</li> <li>• Initiate call back program</li> </ul>	<ul style="list-style-type: none"> <li>• Retention of first time, full time freshmen from fall to fall</li> <li>• First time, full time freshmen graduate within 6 years</li> </ul>	<ul style="list-style-type: none"> <li>• Persistence rates of FTFT EFR have increased to 50% by 2008</li> <li>• Persistence rates of ET students have increased to 75% by 2008</li> <li>• Graduations of ET students have increased by 10% by 2008</li> </ul>	•	•
2. To develop and maintain industrial partnerships	<ul style="list-style-type: none"> <li>• Nurture current industrial relationships</li> <li>• Make contact (especially through new faculty) with new potential partners</li> <li>• Make and develop new contacts in the Shreveport area</li> <li>• Continue involvement in the Conference for Education and Industry Collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Existing relationships do not fold</li> <li>• A new relationship begins every one to two years</li> </ul>	<ul style="list-style-type: none"> <li>• Existing relationships are maintained</li> <li>• A new industrial relationship is developed by 2006</li> </ul>	•	•

## 4. Program Educational Objectives<sup>2</sup> and Program Expected Learning Outcomes

Nearly every Program (Expected Learning) Outcome could be linked with every Program Educational Objective. For assessment purposes, the *primary linkages* are established on the following pages. This allows assessments of program outcomes to contribute to the assessment of program objectives as part of the annual assessment of the strategic plan.

### *Associate of Science, Electronics Technology*

#### *Program Educational Objectives*

1. Demonstrate technical proficiency in the field
2. Be innovative in solving technical problems
3. Effectively communicate technical knowledge, ideas, and proposals to others, including management
4. Participate on project teams in successful completion of projects

#### *Program Expected Learning Outcomes*

- a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines, specifically
    - the application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers to the building, testing, operation, and maintenance of electronic systems
  - b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology, specifically
    - the application of physics to electronics circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry
  - f. An ability to identify, analyze and solve technical problems
  - h. A recognition of the need for, and an ability to engage in lifelong learning
- 
- b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology
  - c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
  - d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives
  - f. An ability to identify, analyze and solve technical problems
- 
- g. An ability to communicate effectively
  - h. A recognition of the need for, and an ability to engage in lifelong learning
- 
- e. An ability to function effectively on teams
  - f. An ability to identify, analyze and solve technical problems
  - g. An ability to communicate effectively
  - i. An ability to understand professional, ethical and social responsibilities
  - j. A respect for diversity and a knowledge of contemporary professional, societal and global issues
  - k. A commitment to quality, timeliness, and continuous improvement

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<sup>2</sup> The Program Educational Objectives are also the Strategies identified for the accomplishment of [Objective 2 of Goal 2](#). These Program Educational Objectives are the links between the departmental and university Strategic Plans and the Program Expected Learning Outcomes as shown on this and the following pages.

# ***Bachelor of Science, Electronics Engineering Technology***

## ***Program Educational Objectives***

1. Demonstrate technical proficiency in the field
2. Effectively communicate technical knowledge, ideas, and proposals to others, including upper management
3. Apply quantitative reasoning and critical thinking in solving technical problems
4. Lead project teams in successful completion of projects
5. Fully understand the processes, services or products of their company

## ***Program Expected Learning Outcomes***

- a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines, specifically
  - The application of circuit analysis and design, computer programming, associated software, analog and digital electronics, and microcomputers to the building, testing, operation, and maintenance of electronic systems
  - The ability to analyze, design, and implement control systems, communications systems, and microprocessor systems
  - The ability to apply project management techniques to electronics systems
- b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology, specifically
  - The application of physics to electronics circuits in a rigorous mathematical environment at or above the level of algebra and trigonometry
  - The ability to use transform methods and applied differential equations in support of electronics systems
- f. An ability to identify, analyze and solve technical problems
- h. A recognition of the need for, and an ability to engage in lifelong learning
- g. An ability to communicate effectively
- h. A recognition of the need for, and an ability to engage in lifelong learning
- c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
- d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives
- f. An ability to identify, analyze and solve technical problems
- e. An ability to function effectively on teams
- f. An ability to identify, analyze and solve technical problems
- g. An ability to communicate effectively
- j. A respect for diversity and a knowledge of contemporary professional, societal and global issues
- k. A commitment to quality, timeliness, and continuous improvement
- h. A recognition of the need for, and an ability to engage in lifelong learning
- i. An ability to understand professional, ethical and social responsibilities
- k. A commitment to quality, timeliness, and continuous improvement

# ***Bachelor of Science, Industrial Engineering Technology***

## ***Program Educational Objectives***

1. Demonstrate technical proficiency in the field
2. Apply quantitative reasoning and critical thinking in solving technical problems
3. Effectively communicate technical knowledge, ideas, and proposals to others, including upper management
4. Lead project teams in successful completion of projects
5. Have strong organizational and management skills

## ***Program Expected Learning Outcomes***

- a. An appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines, specifically
    - An ability to apply knowledge of probability, statistics, engineering economic analysis and cost control, and other technical sciences and specialties necessary in the field of industrial engineering technology
  - b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology, specifically
    - An ability to accomplish the integration of systems using appropriate analytical, computational, and application practices and procedures
  - f. An ability to identify, analyze and solve technical problems
  - h. A recognition of the need for, and an ability to engage in lifelong learning
- 
- b. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology
  - c. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
  - d. An ability to apply creativity in the design of systems, components or processes appropriate to program objectives
  - f. An ability to identify, analyze and solve technical problems
- 
- g. An ability to communicate effectively
  - h. A recognition of the need for, and an ability to engage in lifelong learning
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- e. An ability to function effectively on teams
  - f. An ability to identify, analyze and solve technical problems
  - g. An ability to communicate effectively
  - j. A respect for diversity and a knowledge of contemporary professional, societal and global issues
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