2003-2004

Self Study Questionnaire
Part 1 and Part 2
for
Control Systems Engineering Technology
and
Mechanical Engineering Technology
(Related Programs)

Submitted by
Texas A&M University-Corpus Christi
A special thanks to all those that assisted in the preparation of this document and in the ongoing development of the Engineering Technology Program at Texas A&M University-Corpus Christi.

Dr. J. Tim Coppinger, PE, CMfgE
Professor and Engineering Technology coordinator
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Part 1
A. Background

1. Titles

The Engineering Technology Unit offers Bachelor of Science degrees in Control Systems Engineering Technology and Mechanical Engineering Technology. There are no tracks or options in the curriculum. The Mechanical Engineering Technology students may select from 2 groups of 3 technical electives each. The degree titles are indicated on transcripts and the degree (Bachelor of Science) is indicated on the diplomas.

2. Program Modes

The Engineering Technology Unit offers a traditional day program. The majority of its courses are offered in the afternoon and evening time frame. The unit does not offer separate evening, distance learning or co-op curriculum. Courses are typically offered once per year and are taken by all students as required.

The Control Systems Engineering Technology and Mechanical programs are closely related. They share 59 hours of common technical courses. The Control Systems Engineering Technology curriculum has 29 unique hours of courses and the Mechanical Engineering Technology curriculum has 31 unique hours. The two degree programs share a common administration.

3. Actions to Correct Previous Finding

The Engineering Technology Program at Texas A&M Corpus Christi began in January 1998. There have been no previous accreditation visits.

B. Accreditation Summary

1. Students and Graduates

a. List Outcomes that have been established for the program

The goal of the Engineering Technology Program is to prepare well-educated, highly skilled, and socially and professionally responsible engineering technologist from a diverse population of students so that they can have productive and rewarding careers at local, state and national levels. To ensure that our graduates are valued by the industry and to continually improve our program, input is sought from employers, our alumni and an industry advisory board so that the changing needs of the industry are met. The goals of the Engineering Technology program will remain aligned to the goals of the University.

The Control Systems Engineering Technology Program enables the graduates to:

1. Use modern tools and software packages to analyze, design, and program control systems
2. Apply scientific, engineering, and technological concepts for the analysis, design, development, and operation of control and automation systems
3. Conduct, analyze, and interpret experiments and apply experimental results to improve processes
4. Identify, analyze, and solve technical problems
5. Function effectively on teams
6. Develop plans for implementing quality projects on time and within budget
7. Write quality project reports and deliver oral presentations which are appropriate for technical audiences
8. Understand professional, ethical, social, and global responsibilities
9. Engage in life-long learning and professional development activities

The Mechanical Engineering Technology Program enables the graduates to:
1. Use modern tools and software packages to analyze and design mechanical systems
2. Apply scientific, engineering, and technological concepts for the analysis, design, development, and operation of mechanical and manufacturing systems
3. Conduct, analyze, and interpret experiments and apply experimental results to improve processes
4. Identify, analyze, and solve technical problems
5. Function effectively on teams
6. Develop plans for implementing quality projects on time and within budget
7. Write quality project reports and deliver oral presentations which are appropriate for technical audience
8. Understand professional, ethical, social, and global responsibilities
9. Engage in life-long learning and professional development activities

b. Relationship of Engineering Technology outcomes to the outcomes required by Criterion 1

The outcomes listed for the Control Systems Engineering Technology (CSET) and the Mechanical Engineering Technology (MET or MCET) students are a slight modification of the a-k outcomes listed in Criterion 1 of the TAC-ABET General Criteria.

<table>
<thead>
<tr>
<th>CSET Outcomes</th>
<th>Criterion 1 Outcomes</th>
<th>Differences</th>
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<tbody>
<tr>
<td>1 a</td>
<td>Modified to apply to apply to control systems</td>
<td></td>
</tr>
<tr>
<td>2 b</td>
<td>Modified to apply to apply to control systems</td>
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<tr>
<td>3 c</td>
<td>None</td>
<td></td>
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<tr>
<td>4 d-f</td>
<td>Proper technical solutions involve the use of creativity, criteria combined</td>
<td></td>
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<tr>
<td>5 e</td>
<td>None</td>
<td></td>
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<td>6 k</td>
<td>Rewording to clarify intent</td>
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<tr>
<td>7 g</td>
<td>More specific</td>
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<tr>
<td>8 i-j</td>
<td>Combined due to the general societal nature of the outcome</td>
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<td>9 h</td>
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<th>Differences</th>
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</thead>
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<tr>
<td>3 c</td>
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<td>4 d-f</td>
<td>Proper technical solutions involve the use of creativity, criteria combined</td>
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<td>5 e</td>
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<td>8 i-j</td>
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<td>9 h</td>
<td>Rewording to clarify intent</td>
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</tbody>
</table>
c. Describe the process to produce each of the outcomes.

The curriculum has been designed to create the desired outcomes by course content and course sequencing. The matrix below indicates how various courses address each outcome. An expanded matrix is available on site that describes the assignments or activities that each X represents.

Even though the program outcomes 1 and 2 are slightly different for each degree, the course outcomes for the common courses are considered to be the same.

**Table 2 Course Outcome Matrix**

<table>
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<tr>
<th>Outcomes</th>
<th>1</th>
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</table>
In addition to course related activities the students are mentored by the faculty. The faculty serves as role models for the criteria that require an understanding of professional, ethical, and social responsibilities.

d. Describe the process, measures, and instruments used to assess each program outcome.

The following instruments are used for the assessment of the program.
1. Instructor and Course Evaluation form (College of Science and Technology instrument)
2. Course Objective Feedback (Engineering Technology form)
3. Graduating Senior Exit Survey (Engineering Technology form)
4. Alumni Survey (Engineering Technology form)
5. Employer Survey (Engineering Technology form)
Examples of these instruments may be found in Appendix 1.

Near the completion of each course a college wide Instructor and Course Evaluation forms are administered. Student feedback from these questionnaires is used to improve course content, method of instruction, and the performance of the instructor.

Within each course examination questions and/or assignments target each of the course objectives. Students complete Course Objective Feedback forms that solicit their opinion of their knowledge of each course objectives. Each form is unique to that particular course and addresses the stated objectives for that course.

The Graduating Senior Exit Survey is used to obtain information about the students immediate plans for the future, information about their search for employment, and a hind-site perspective of the Engineering Technology program.

The Alumni Survey is used to gather information about the graduate’s career status. Information such as their place of employment, job title, satisfaction with their academic preparation, and opinion of their career mobility opportunities is obtained. This survey is conducted 6 months after graduation. The Engineering Technology Program administers the survey. In order to track the career performance all graduates will be surveyed every 2 years.

The Employer Survey asks if the graduate has demonstrated the a-k characteristics of TAC-ABET Criterion 1 and solicits possible areas of improvement in the Engineering Technology program.

The manner in which this data is used is discussed under the Continuous Improvement plan

e. Describe materials available for review that will demonstrate the outcomes

The following materials will be available for review:
1. Representative samples of student work
2. Expanded course outcome matrix
3. Exit Survey data
4. Alumni Survey data
5. Employer Survey data

The expanded course outcome matrix indicates which assignments and exercises support which program outcomes. The material will be organized by course and cross-referenced to the outcomes. Textbooks, course syllabi, handouts, and other teaching material will also be displayed. Video tape recordings of selected oral presentations will be available for viewing.

2. Program Characteristics

a. Table 3. Curriculum
# Table 3 Curriculum
## Control Systems Engineering Technology

<table>
<thead>
<tr>
<th>Year and Semester</th>
<th>Course</th>
<th>Category (Credit Hour)</th>
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<td></td>
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<td>Communications</td>
</tr>
<tr>
<td>Yr. 1 Sem1</td>
<td>Core, UCCP 1101 Freshman Seminar</td>
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<tr>
<td>Yr. 1 Sem1</td>
<td>ENGL 1301 English Composition I</td>
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<tr>
<td>Yr. 1 Sem1</td>
<td>SOCI 1301 Human Societies</td>
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<tr>
<td>Yr. 1 Sem1</td>
<td>ENTC 1203 Introduction to the Process Industry</td>
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<tr>
<td>Yr. 1 Sem1</td>
<td>ENTC 1304 Engineering Design Graphics I</td>
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<td>ARTS 1301 Art and Society</td>
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<td>CHEM 1111/1311 General Chemistry</td>
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<tr>
<td>Yr. 1 Sem2</td>
<td>COSC 1435 Introduction to Problem Solving, With Computers</td>
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**Mechanical Engineering Technology**

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The Technical Electives can be selected from ENTC 3346 Cost Estimating, ENTC 4348 Structural Steel Construction, ENTC 4349 Reinforced Concrete Construction or ENTC 4335 Rotating Equipment, ENTC 4336 Total Productive Maintenance, ENTC 4338 Total Productive Maintenance II
Figure 1  Control Systems Engineering Technology Flow Diagram  
(Technical Courses Only)
Figure 2  Mechanical Engineering Technology Flow Diagram
(Technical Courses Only)
General Education Core Curriculum
The heart of an integrated educational experience is the foundation laid by the general education core curriculum. A&M-Corpus Christi requires all graduates to have completed a core of general education courses. The University core curriculum is a 46-48-semester-hour program of study, which serves as the common foundation for all majors and is required of undergraduates. Conceptually, the University Core Curriculum Program enhances the intellectual flexibility and effectiveness of each individual and provides a foundation of skills and information that enables graduates to assume leadership positions in the world of the twenty-first century. Students will be involved with core curriculum course work through the junior year. (Undergraduate transfer students have several ways of fulfilling the core curriculum requirement. For details, please see “General Education Requirement” in the section entitled “Undergraduate Programs” In the University Catalog.

The University core curriculum incorporates the following components: intellectual skills, perspectives, University core curriculum courses, Triads or Tetrads.

Intellectual Skills: The intellectual skills include reading, writing, speaking, listening, mathematical competency, and critical thinking.

Perspectives: The intellectual skills are taught in the context of specific areas in the liberal arts and sciences. The content of areas were chosen to provide four curriculum perspectives:
1. The individual in relation to the larger society and the world, with emphasis on understanding contrasting views;
2. The principles and ethics that govern human interaction in society and the production of goods and services;
3. The phenomena of the physical world and its relationship with the individual and society;
4. The relationships among abstract quantities.

University Core Curriculum Courses: Every course that may be taken to satisfy core curriculum requirements has been reviewed and approved on the basis of its subject matter, and its potential to help students develop one or more constituents of the intellectual skills and curriculum perspectives. The core curriculum courses for 2002-2003 are listed below.

English Composition (6 sem. hrs.)
ENGL 1301 Composition I *
ENGL 1302 Composition II *
U.S. History (6 sem. hrs.)
HIST 1301 U.S. History to 1865
HIST 1302 U.S. History Since 1865
Political Science (6 sem. hrs.)
POLS 2305 United States Government and Politics
POLS 2306 State and Local Government
Natural Science (6-8 sem. hrs.) Select two from:
ASTR 1311 Introduction to Space Science
BIOL 1406 Biology I
BIOL 1407 Biology II
CIIEM 1311 General Chemistry I
CHEM 1312 General Chemistry II
ESCI 1401 Environmental Science I: Introduction to Environmental Science
ESCI 1402 Environmental Science II: Earth System Science
GEOL 1403 Physical Geology
GEOL 1404 Historical Geology
PHYS 1401 General Physics I
PHYS 1402 General Physics II
PHYS 2425 University Physics I
PHYS 2426 University Physics II
Mathematics (4 sem. hrs., including 1 sem. hr. lab) - Select one from:
- MATH 1470 Introduction to Modeling
- MATH 2413 Calculus I

Oral Communication (3 sem. hrs.)
- COMM 1315 Public Speaking

Economics (3 sem. hrs.)
- ECON 2301 Macroeconomic Principles

Social Science (3 sem. hrs.) - Select one from:
- PSYC 2301 General Psychology
- SOCI 1301 Human Societies

Literature (3 sem. hrs.) - Select one from:
- ENGL 2332 Literature of the Western World: from the Classics to the Renaissance
- ENGL 2333 Literature of the Western World: from the Enlightenment to the Present
- SPAN 3306 Literature of the Spanish-Speaking World

Fine Arts (3 sem. hrs.) - Select one from:
- ARTS 1301 Art and Society
- MUST 1306 Understanding and Enjoying Music
- MUSI 1307 Elements of Musical Style
- THEA 1310 The Art of the Theatre

Philosophy (3 sem. hrs.)
- PHIL 3340 Foundations of Professional Ethics

Students should complete ENGL 1301 and ENGL 1302 early in their academic careers—at the very latest, by the end of the sophomore year. Students who transfer into the University without equivalent credit should complete these courses as soon as possible.

**Triads and Tetrads:** Triads and Tetrads are special clusters of courses designed for first-year students. All full-time students are expected to enroll in a Triad or Tetrad during each of their first two semesters. A Triad includes one introductory-level core curriculum course taught in a large lecture hall, and a Tetrad includes two introductory-level core curriculum courses that are taught in large classes. A Triad or Tetrad also includes a required English Composition course and a First-Year Seminar (UCCP course) taught in groups of 25 students. Enrollment in a Triad is thus a 2 semester hour commitment, and enrollment in a Tetrad is a 10-11 semester hour commitment. Placement into either a Triad or Tetrad will be determined in the advising process.

Engineering Technology Students are advised to enroll in a triad. The University will offer several Triads and Tetrads in each regular semester of the 2002-2003 academic year. Triads and Tetrads offered during 2002-2003 may include the following:

**Tetrad A: Earth Trek**
- ENGL 1301 or 1302**
- ESCI 1401
- SOCI 1301
- UCCP 1101 or 1102**

**Tetrad B**
- ENGL 1301 or 1302**
- HIST 1301

**Tetrad C**
- ENGL 1301 or 1302**
- MUST 1306
- PSYC 2301
- UCCP 1101 or 1102**

**Tetrad D**
- ENGL 1301 or 1302**
- HIST 1302
- POLS 2306
- UCCP 1101 or 1102**

**Tetrad F**
- BIOL 1407
- CHEM 1312
- ENGL 1301 or 1302**
- UCCP 1101 or 1102**

**Tetrad G**
- ENGL 1301 or 1302**
- HIST 1302
- UCCP 1101 or 1102**

**Triad H**
- ENGL 1301 or 1302**
- POLS 2305
- UCCP 1101 or 1102**

**Triad I**
- HIST 1302
- ENGL 1301 or 1302**
b. Credit Hours and Distribution

The Control Systems Engineering Technology degree requires a total of 130 semester hours that are distributed as follows: communications 11, mathematics 14, physical and natural sciences 12, social science and humanities 27, and technical content 66 hours. There is a total of 52 hours taught at the junior and senior levels.

The Mechanical Engineering Technology degree requires a total of 132 semester hours distributed as follows: communications 11, mathematics 11, physical and natural science 12, social sciences and humanities 27, and technical content 71. There is a total of 46 hours taught at the junior and senior levels.

c. Describe the process to assure the quality of the core courses.

The general education core courses are reviewed every five years as part of the Southern Association of Colleges and Schools (SACS) program review process.

Engineering Technology courses, including courses common to both curricula, are evaluated at the end of each course. Feedback from the students is obtained concerning their perception of how well the objectives of each course have been satisfied. The course instructor prepares an improvement plan and then it is discussed with the other faculty members for approval.

d. Course Outlines:
Texas A&M University – Corpus Christi
College of Science and Technology
Engineering Technology

Course number and title: **ENTC 1203 Introduction to the Process Industry**

**Weekly Schedule:** 1 hour lecture and 3 hours laboratory

**Prerequisite:** None

**Course Description:**
Includes industry terminology; health and safety issues; environmental issues; overviews of plant equipment, basics of process control, and plant organization; plant tours required.

**Textbooks**

**Course Objectives**
This course is designed to enable students to:

- Define key terms used in process technology.
- Describe the roles and responsibilities of process technicians and technologists.
- Identify instruments and equipment used in the process industry.
- Describe and apply the basic principles of pressure, fluid flow, temperature, and distillation.
- Describe the operations and applications of valves, pumps, compressors, steam turbines, and heat exchangers.
- Define quality control principles and terms.
- Describe air pollution control, solid waste control, toxic substance control, and community right-to-know principle.
- Define standards and codes found in a safety program.
- Contrast the burning of solids, liquids, and gases.

**Assessment**

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Topics covered:
Process technicians, roles and responsibilities, college training programs, fundamental skills needed by technicians, basic principles of pressure, heat transfer and temperature, fluid flow, purpose of valves, types of valves, relief and safety valves, types of pumps, compressor principles, compressor types, steam turbines, quality control, basic instruments and electronics, measurement of temperature, pressure, level, and flow, heat exchangers, reboilers, condensers, Fired heaters, Furnace types, Cooling towers, Reactor types, Process chemistry, chemical equations and reactions, the periodic table, pH measurements, distillation principles and systems, steam systems, boiler operations and functions, extruder operations, plastics equipment and operations, environmental awareness, air and water pollution control, solid waste and toxic substance control, emergency response, community-right-to-know, process safety programs, safety standards and codes, fire dynamics, chemical explosions, flame propagation, smoke movement.

Laboratory Exercises/Experiments:
Lab 1 DEXTER lesson 1
Lab 2 DEXTER lesson 9, 14
Lab 3 DEXTER lesson 2
Lab 4 DEXTER lesson 3
Lab 5 DEXTER lesson 4
Lab 6 DEXTER lesson 5
Lab 7 DEXTER lesson 6
Lab 8 DEXTER lesson 7
Lab 9 DEXTER lesson 8
Lab 10 DEXTER lesson 10
Lab 11 DEXTER lesson 11
Lab 12 DEXTER lesson 12
Lab 13 DEXTER lesson 13
Lab 14 DEXTER lesson 15, 16

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Hesham Shaalan
Date: Fall 2002
Course Number and Title: ENTC 1304 - Engineering Design Graphics

Weekly Schedule: Two hour lecture, four hour laboratory

Course Description
This course is an introduction to design process through computer aided drafting. Topics such as dimensioned orthographic, isometric view and solids models of engineering designs are covered.

Course Prerequisite
None

Textbooks
The workbook is “Creative Engineering Graphics” by Gerald E. Vinson.

Course Objectives
This course is designed to enable the student to:
• Understand the basic steps in the design process.
• Effectively communicate the design solutions to paper by using standard graphical representation methods using both sketching and computer graphics software.
• Understand the functioning of a design team and develop skills to effectively participate in a team.
• Make written and oral presentation of a solution to a design problem.

Assessment
Grading is done as follows:

Eight 15 minute exams 30%
Final Exam 15%
Working Drawings 15%
Daily Assignments 25%
Team Design Project 15%
Total 100%
The Daily assignments are graded as follows:

Correctness of the solution     65%
Proper application of standards 20%
Neatness of work               10%
Completion of title block       5%
Total                           100%

The Team Design Project is graded as follows:

Project Identification     15%
Preliminary Ideas            15%
Refinement                 20%
Analysis                   20%
Decision                   10%
Documentation              10%
Presentation               10%
Total                      100%

Some of the work in this course is completed and evaluated as a team. Other work is completed as individual effort.

**Topics Covered**

**Lab Experiments**
The laboratory portion of this course is integrated with the lecture.

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared By:** Satyajit Verma  
**Date:** Spring 2003
Course Number and Title: ENTC 2202 Manufacturing Process I

Weekly Schedule: 1 hour lecture and 3 hours laboratory

Prerequisites: None

Course Description:

The course is an introduction to manufacturing processes for metallic materials. Machines and technologies used for casting, forming, fabricating and joining these materials will be described and discussed. Some “hands on” experience with these processes will be included.

Textbook


Course Objectives

This course is designed to enable students to:

- Understand basic metallurgical concepts appropriate for metal forming and cutting.
- Describe flow, heat transfer and solidification of metals during the casting processes.
- Learn the terminology of metal manufacturing processes.
- Determine appropriate processes for the manufacture of a given part.
- Plan the process sequence for typical sheet metal part.
- Compare the capabilities of different machining operations.
- Optimize parameters for cutting operations.
- Select joining processes for joining operations

Assessment

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</table>
Topics Covered:

Laboratory Exercises/Experiments:
Lab 1. Sand Mold Preparation
Lab 2. Wire Drawing
Lab 3. Hand Forging Demonstration
Lab 4. Aluminum Handy Box Project
Lab 5. Turning and Facing on Manual Lathe
Lab 6. Threading using Taps, Dies
Lab 8. Welding Using GMAW and GTAW Processes

Relationship of this Course to Program Objectives
Please refer to the “Objectives Matrix” in Appendix A.

Prepared by: Karl Schuler Date: Fall 2002
Course Number and Title: ENTC 2204 Manufacturing Process II

Weekly Schedule: 1 hour lecture and 3 hours laboratory

Prerequisites: ENTC 2202 Manufacturing Process I

Course Description:
The course is an introduction to manufacturing processes for polymeric, ceramic, and composite materials. Machines and technologies used for forming, fabricating and joining these materials will be described and discussed. Metrology, QA, and production scheduling will also be discussed. Some “hands on” experience with these processes will be included.

Textbook


Course Objectives

This course is designed to enable students to:

- Understand basic concepts of polymeric material structures.
- Perform injection molding and vacuum forming operations.
- Fabricate molds and lay-up a composite structure.
- Compare and calibrate various measuring instruments.
- Program and operate CNC machine tools.
- Prepare operating procedure documents.

Assessment

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**Topics Covered:**

**Laboratory Exercises/Experiments:**
Lab 1. Slip Casting Ceramics
Lab 2. Vacuum Forming Plastics
Lab 3. Injection and Blow Molding of Plastics
Lab 4. Composite Fabrication – Hand Lay-up and Vacuum Bagging
Lab 5. Metrology and Parts Inspection
Lab 6. Safe Operating Procedures
Lab 7. Quality Assurance
Lab 8. Robotics and Manufacturing Automation

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared by:** Karl Schuler  
**Date:** Fall 2002
Course Number and Title:  ENTC 2305 Engineering Design Graphics II

Weekly Schedule:  2 hours lecture, 4 hours laboratory

Prerequisites:  ENTC 1304 Engineering Design Graphics I

Course Description:  Use of computer aided design and drafting in process piping, instrumentation documentation, electronics, electrical power, structural steel and reinforced concrete.

Textbooks & Supplies

Course Objectives
This course is designed to enable students to read and understand
- Interrupt a typical set of construction drawings used in the process industry.
- Understand the codes and standards that apply to the graphics used by the process industry
- The student should be able to prepare and use various drawing symbols using AutoCAD.

Assessment
GRADING POLICY
- EXAM 1 20%
- EXAM 2 20%
- HOMEWORK 20%
- PROJECT 20%
- FINAL EXAM 20%

Topics Covered
Introduction, scope definition, identification of applicable topics and standards and codes, use of Mechanical Desktop, reports on standard organizations, use of architectural desktop, architectural drawings, electrical power and electronics. Concrete detailing, structural steel detailing, piping, ISA Instrumentation & Controls, Project development and final presentation.

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by:  Tim Coppinger  Date:  Fall 2002
Course Number and Title: ENTC 2403 - Statics and Dynamics

Weekly Schedule: Two and half hour lecture and one and half hour laboratory.

Course Prerequisites
PHYS 2425 (University Physics I), MATH 2413 (Calculus I)

Course Description

Textbooks

Course Objectives
This course is designed to enable the student to:
• Understand the basic concepts of engineering mechanics.
• Use a logical approach to construct free body diagrams of a rigid body and solve problems in mechanics.
• Perform structural analysis of trusses, frames and machines using principles of statics.
• Understand the basic concepts of particle dynamics.
• Critique machine and structural designs and recommend improvements in a written and oral format.

Assessment Method

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Topics Covered

Laboratory Exercises / Experiments
The laboratory experiments in this course are integrated into the lectures. Appropriate demonstrations and experiments are carried out during the lectures as and when needed.

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Satyajit Verma

Date: Spring 2003
Texas A&M University – Corpus Christi  
College of Science and Technology  
Engineering Technology

Course number and title: **ENTC 2414 Circuit Analysis I**

**Weekly Schedule:** 3 hours lecture and 3 hours laboratory

**Prerequisite:** PHYS 2426

**Course description:**  
Includes fundamentals of electrical potential, current, and electrical power in DC circuits; laws and relationships applied to the analysis of circuits; resistance, capacitance, and inductance.

**Textbooks**  

**Course Objectives**  
This course is designed to enable students to:  
- Develop an understanding of the physical properties and mathematical concepts that govern resistors, capacitors, and inductors.  
- Have an understanding of network theorems that are used to analyze electrical circuits.  
- Develop a basic understanding of the different ways electrical energy is generated.  
- Comprehend the principles governing magnetism and magnetic devices.  
- Become familiar with physical components, schematic symbols, resistor color code, electrical units, and relationships of electrical quantities.  
- Gain instrument measurement skills using series, parallel, and series-parallel circuits.

**Assessment**

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Topics covered:
Units of measurement, systems of units, symbols, conversion tables, current, voltage, fixed supplies, conductors and insulators, semiconductors, ammeters and voltmeters, resistance, color coding, conductors, ohmmeters, Ohm’s law, power, wattmeters, efficiency, energy, series circuits, Kirchhoff’s voltage law, voltage divider rule, voltage regulation, measurement techniques, parallel networks, Kirchhoff’s current law, current divider rule, open and short circuits, series-parallel networks, ladder networks, grounding, current sources, source conversions, branch-current analysis, mesh analysis, nodal analysis, wye-delta and delta-wye conversions, superposition, Thevenin’s and Norton’s theorems, maximum power transfer, capacitance, types of capacitors, energy storage by a capacitor, capacitors in series and parallel, magnetic fields, flux density, permeability, reluctance, magnetic circuits, magnetic flux, inductance, types of inductors, Faraday’s law, induced voltage, energy storage by an inductor, inductors in series and parallel.

Laboratory Exercises/Experiments:
Lab 1 Lab instruments
Lab 2 Current and voltage
Lab 3 Resistance, color coding
Lab 4 Ohm’s law, power & energy
Lab 5 Series circuits
Lab 6 Parallel circuits
Lab 7 Series-parallel circuits
Lab 8 Methods of analysis
Lab 9 Networks theorems
Lab 10 Networks theorems
Lab 11 Capacitors
Lab 12 Capacitors
Lab 13 Magnetic circuits
Lab 14 Inductors

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Hesham Shaalan
Date: Fall 2002
Course Number and Title: ENTC 3310 Material Science I

Weekly Schedule: 2 hours lecture and 2 hours laboratory

Prerequisites: None

Course Description:

The course is an introduction to the mechanical properties of polymers, composites, elastomers, wood, and concrete. Tests and technologies for characterizing and selecting these materials will be described and discussed.

Textbook:


Course Objectives:
This course is designed to enable students to:

- Understand the relationship between chemical bonds and material characteristics.
- Determining the Miller indices of planes and directions in common crystals.
- Analyze packing factor and coordination number for common crystal lattices.
- Calculate the critical resolved shear stress required for dislocation motion.
- Interpret photomicrographs to determine grain size.
- Determine material properties from tensile test data.
- Use the phase diagram to predict the cooling behavior of metals.
- Determine hardness changes during annealing.
- Predict property changes produced by work hardening.
- Calculate phase amounts in an alloy using the lever law.
- Describe the effects of non-equilibrium solidification.
- Use TTT diagrams to predict the microstructure resulting from various heat treatments.
- Select a metal for a design application.
Assessment

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**Topics Covered:**

**Laboratory Exercises/Experiments:**
Lab 1. Structural Models of BCC, FCC, HCP Crystals
Lab 2. Tensile Testing of Metals
Lab 3. Ultrasonic Determination of Elastic Moduli
Lab 4. Rockwell Hardness Testing
Lab 5. Creep Test of Polymeric Material
Lab 6. Composite Beam Fabrication
Lab 7. Three-point Bend Test of Composite Beam
Lab 8. Compression Test of Wood
Lab 9. Shear Test of a Glue Joint

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared by:** Karl Schuler  
**Date:** Fall 2002
Course Number and Title: ENTC 3312 Material Science II

Weekly Schedule: 2 hours lecture and 2 hours laboratory

Prerequisites: ENTC 3310 Material Science I

Course Description:

This course is an introduction to the mechanical properties, thermal processing, corrosion, and non-destructive testing of metals. Tests and technologies for heat treating, characterizing and selecting metallic materials are described and discussed.

Textbook:


Course Objectives:

This course is designed to enable students to:

- Use the phase diagram to predict the cooling behavior of metals.
- Calculate the solidification time of metals during casting.
- Determine hardness changes during annealing.
- Predict property changes produced by work hardening.
- Calculate phase amounts in an alloy using the lever law.
- Describe the effects of non-equilibrium solidification.
- Characterize three phase regions in phase diagrams.
- Use TTT diagrams to predict the microstructure resulting from various heat treatments.
- Understand basic concepts of non-destructive testing.

Assessment

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Topics Covered:

Laboratory Exercises/Experiments:
Lab 1. Annealing of Work-hardened Brass
Lab 2. Cooling Rate Curves of an Aluminum Alloy
Lab 3. Jominy Test of Steel Alloys
Lab 4. Precipitation Hardening and Over-aging of Aluminum Alloys
Lab 5. Metallographic Specimen Preparation
Lab 6. Grain Size Determination of Brass Specimens
Lab 7. Crevice Corrosion Test
Lab 8. Dye Penetrant Crack Detection

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Karl Schuler Date: Fall 2002
Course Number and Title: ENTC 3316 Strength of Materials

Weekly Schedule: 2 hours Lecture and 2 hour Laboratory

Prerequisite: ENTC 2403 Statics and Dynamics

Course Description
Analysis of internal forces in structural members, mechanical devices and systems and application of these concepts in their safe design, basic concepts in strength of materials, direct tensile and compressive stresses, torsional shear and shear stresses due to bending, deformation / deflections under various types of stresses, combined stresses, column stability and pressure vessels.

Textbooks

Course Objectives
This course is conducted so that the students can:
• Use a logical approach to solving structural design problems.
• Calculate direct normal, direct shear and torsional shear stresses and stresses due to bending moments and torsion.
• Calculate stress concentration due to geometry changes.
• Calculate stress distribution in members undergoing combined stresses.
• Calculate deformations due to normal stresses, torsional shear and bending moments.
• Perform detailed stress analysis of simple structures, beams, columns, vessels and mechanical devices.
• Evaluate safety of structures, devices or systems.
• Critique designs and recommend improvements in a written and oral format.

Assessment Method

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Topics Covered

Laboratory Exercise / Experiments
1. Stress, Strain and Modulus of Elasticity
2. Reaction Forces at the Support as a Function of Beam Loading
3. Beam Deflection under Various Types of Loading Conditions
4. Relationship of Beam Stiffness to Beam Deflection
5. Angular Deflection as a Function of Torsional Shear
6. Column Constant and Critical Load

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Satyajit Verma          Date: Fall, 2002
Course Number and Title: ENTC 3320 Thermodynamics

Weekly Schedule: 3 hours lecture

Prerequisites: PHYS 2425 University Physics I and MATH 2414 Calculus II

Course Description:
This course is an introduction to thermodynamics. The course covers the thermodynamic properties of liquids and vapors in non-flow and steady flow processes. The ideal gas law and non-ideal gases will be studied in relation to work and energy. The relationships between enthalpy, entropy, and internal energy will be covered. Refrigeration, power plants, steam, turbines, compressors, and internal combustion engines will be studied. Some basic calculus will also be used.

Textbooks
1. Introduction to Thermodynamics and Heat Transfer, Yunus A. Cengel, McGraw-Hill, 1997

Course Objectives
This course is designed to enable students to:
- Gain an intuitive understanding of thermodynamic concepts
- Communicate thermodynamic concepts to peers.
- Use diagrams, tables, & equations to analyze, understand & solve thermodynamic problems
- Write complete & logical solutions to problems and present them to the class
- Have a basic knowledge to prepare for the thermodynamics portion of the E.I.T. Exam.
- Know when the ideal gas equation can be applied to a system
- Calculate the power output and efficiencies of heat engines.
- Use entropy and enthalpy to define a Carnot cycle
- Calculate the COP for refrigeration and heat pumps.
Assessment

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Topics Covered
SI and English units, work, kinetic energy, internal energy, Zeroth Law of Thermodynamics, phase change, critical point, saturated curve, temperature-volume graphs, pressure-volume graphs, triple point, thermodynamic tables, ideal gas equation of state, compressibility and reduced pressure & temperature, Van der Waals equation of state, boundary work, polytropic process, spring work, First Law of Thermodynamics, specific heats, incompressible solids & liquids, conservation of mass and energy, steady flow processes, Second Law of Thermodynamics, heat engines, Kelvin-Planck statement, refrigeration & heat pumps, COP, Carnot Cycle, entropy, Clausius inequality, temperature-entropy graphs, isentropic processes, reversible processes, Otto Cycle, Diesel Cycle, Brayton Cycle, Rankine Cycle, reversed Carnot Cycle, pressure-enthalpy graphs, and psychrometrics.

Laboratory Exercises/Experiments: (proposed for future)
Lab 1  F123 versus F134a chillers in the A&M-Corpus Powerhouse
Lab 2  COP of the chillers in the A&M-Corpus Powerhouse
Lab 3  Boiler thermal efficiency for the Process Bench

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Larry White  Date: Fall 2002
Texas A&M University-Corpus Christi  
College of Science and Technology  
Engineering Technology

**Course Number and Title:** ENTC 3323 Manufacturing Automation

**Weekly Schedule:** 2 hours lecture, 3 hours laboratory

**PREREQUISITES**
Junior Standing or approval of the instructor

**COURSE DESCRIPTION**
Automation in a manufacturing and assembly setting, material handling systems, remote guided vehicles, automated storage and retrieval systems, computer numerical machine tools, robotics.

**TEXTS AND OTHER SUPPLIES**
2. Supplemental reading will be assigned

**COURSE OBJECTIVES**
This course is designed to enable students to:
- Understand the characteristics of robots
- Understand the interrelationships of material handling to the manufacturing process.
- Understand the characteristics of other automated equipment
- Use a logical approach to problem solutions
- Perform a detailed analysis of manufacturing cells
- Critique designs and recommend improvements

**EVALUATION AND GRADE ASSIGNMENT**
- 2 one hour exams 30%
- Final Exam 15%
- Homework Problems 20%
- Written, and Oral reports 15%
- Laboratory & Project 15%
- Employability Factor 5%

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared by:** Tim Coppinger  
**Date:** Fall 2002
Course Number and Title: ENTC 3332 Design of Machine Elements I

Weekly Schedule: 3 hours lecture

Prerequisites: ENTC 3316 Strength of Materials

COURSE DESCRIPTION
Nature of design, team dynamics, keys, couplings, gears, belt and chain drives, plain and rolling contact bearings, clutches, brakes; use of catalogs for part selection

Textbooks and Other Supplies
2. Machinery’s Handbook (Optional)
3. Engineer’s Pad
4. Good Scientific Calculator

COURSE OBJECTIVES
This course is designed to enable students to:
- Apply the design process to the solution of mechanical power transmission problems
- Understand the manner in which belts and chains transmit power
- Size and select hydrodynamic bearings
- Size and select mechanical fasteners and bolted connections

Assessment
Grades will be determined as follows:
One hour exams (2@20%) 40%
Final Exam (Comprehensive) 25%
Homework & Daily Quizzes 35%

Topics Covered
Nature of mechanical design, materials in mechanical design, belts and chains, belts and chains, bearings with rolling contact, plain bearings, keys and couplings, electric motors, power screws, fasteners, springs, frames and bolted connections, clutches and brakes, and application problems.

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Tim Coppinger  Date: Fall 2002
Course Number and Title: ENTC 3346 Cost Estimating

Weekly Schedule: 2 hours lecture and 3 hours laboratory

Prerequisites: Junior Standing

COURSE DESCRIPTION
Introduction to contracting, labor and equipment costs, indirect and general overhead costs, and estimates. Case studies used.

PREREQUISITES
Junior standing

TEXTS AND OTHER SUPPLIES
1. Construction Cost analysis and estimating, Phillip F. Ostwald, Printice Hall, N.J.
2. Engineering pad
3. Good Scientific Calculator
4. Access to a spread sheet program

COURSE OBJECTIVES
This course is designed to enable students to:
- Students will understand the concepts & factors that can impact project costs.
- Students will prepare cost estimates for budgets and for submitting bids.

EVALUATION AND GRADE ASSIGNMENT
Course grades will be determined as follows:
- Mid Term 30%
- Final Exam (Comprehensive) 30%
- Homework & Daily Assignments 25%
- Class participation 15%

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Tim Coppinger Date: Fall 2002
Course Number and Title: ENTC 3406 Fluid Mechanics and Fluid Power

Weekly Schedule: 2 hours Lecture and 2 hour Laboratory

Prerequisite: ENTC 2403 Statics and Dynamics

Course Description
Study of the behavior of liquids and gases at rest or in motion. Subject matters include: measurements of pressure, density, viscosity and flow rate of fluids as commonly practiced in the industry, forces developed by fluids as they flow through pipe, channels and other shapes, energy analysis of fluids at rest and in motion, flow of fluids in series or parallel networks, design of hydraulic and pneumatic circuits, concepts of drag and lift, performance and selection of pumps, compressors and blowers, design of ducts for air flow, commercially available pipe and tubes.

Textbooks

Course Objectives
The course is conducted to enable the students to:
• Understand the basic concepts of fluids statics and dynamics.
• Use a logical approach to solving fluid flow problems.
• Perform calculations related to energy, forces and momentum changes in fluid flow
• Perform pressure drop calculations and power requirement for fluid flow in pipes and open channels.
• Understand pump characteristics and make pump selection appropriate to given application.
• Understand applications of fluid power in components and circuits.
• Critique designs and recommend improvements in a written and oral format.

Assessment Method

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</table>
Topics Covered

Laboratory Exercise / Experiments

1. Viscosity Measurement  
2. Forces on Submerged Bodies and Floating Bodies  
3. Pressure Drop due to Fluid Flow through Pipes.  
4. Pressure Drop due to Fluid Flow through Valves and Fittings.  
5. Performance Curve for a Centrifugal Pump

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Satyajit Verma Date: Fall 2002
Course Number and Title: ENTC 3415 Circuit Analysis II

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 2414 Circuit Analysis I

Course Description:
AC circuit analysis principles: AC generation, periodic functions, average and RMS measurements, complex numbers, phasors, impedance and admittance, methods of analysis, network theorems, power, frequency response, filters, transformers, and balanced three-phase systems.

Textbooks


Course Objectives
This course is designed to enable students to:
- Use Kirchhoff’s Laws to analyze AC circuits.
- Use loop and nodal analysis techniques to analyze series-parallel AC networks.
- Apply the network theorems (superposition, Thevenin’s, Norton’s, etc.) to AC circuits.
- Use various electrical instruments such as function generators, oscilloscopes, etc.
- Use instruments to test series, parallel, and series-parallel AC circuits.
- Differentiate between low-pass, high-pass, stop-band, and high-pass filters.
- Sketch the Bode response of AC circuits.
- Analyze three-phase systems.
- Design simple transformer circuits.
- Design basic household electric wiring circuits.

Assessment

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</table>
**Topics Covered**
Introduction, AC waveforms, Phase measurements, Phasor representations, Series circuits, Parallel Circuits, Series & parallel AC networks, AC methods of Analysis, Network theorems
AC power, Resonance, Filters, Frequency response, Three-phase systems, Transformers Household wiring circuits.

**Laboratory Exercises/Experiments:**
Lab 1   The oscilloscope  
Lab 3   RLC Components  
Lab 4   Frequency Response of RLC Components  
Lab 5   Frequency Response of the series RL Network  
Lab 6   Frequency Response of the series RC Network  
Lab 7   The Oscilloscope and Phase Measurements  
Lab 8   Series sinusoidal Circuits  
Lab 9   Series-Parallel Sinusoidal Circuits  
Lab 10  Thevenin Theorem and Maximum Power Transfer  
Lab 11  Series Resonant Circuits  
Lab 12  Passive filters  
Lab 13  The Transformer  

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared by:** Hesham Shaalan  
**Date:** Fall 2002
Course Number and Title: ENTC 3416 Digital Logic

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 3415 Circuit Analysis II

Course Description:
This course introduces the principles of digital logic analysis and design: Topics include
logic functions, logic gates, number systems and conversions, Boolean algebra, logic
simplification, combinational circuits, programmable logic devices, and sequential
circuits. The laboratory provides hands-on experience with devices and circuits
discussed in the classroom.

Textbooks

Course Objectives
This course is designed to enable students to:
- Convert between decimal, binary, octal and hexadecimal numbers.
- Perform addition and subtraction in the four bases studied (10, 2, 8, and 16).
- Use various codes, ex. ASCII, gray code, BCD, etc.
- Derive and simplify Boolean expressions.
- Use a wide range of digital chips, from simple AND, OR, NOT, NAND and
  NOR gates to adders, subtractors, decoders, and multiplexers.
- Identify basic flip-flop types (D, T, S-R and J-K) and clocking variations
  (edge-triggered, master-slave, and transparent).
- Interpret timing diagrams of flip-flops.
- Analyze circuits derived from flip-flops, ex. counters and shift registers.
- State basic differences between TTL and CMOS.
- Build, test, and troubleshoot digital circuits.
- Use a software package to analyze and design digital circuits.

Assessment

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</table>
Topics Covered
Digital concepts, Number systems and codes, Logic Gates, Boolean algebra, Logic simplification, Combinational logic, NAND and NOR circuits, Combinational logic circuits, PLD arrays and classifications, PALs, PLAs, and GALs, Flip-flops, one-shots, timers, Counters
Shift registers, Integrated Circuit Technologies.

Laboratory Exercises/Experiments:
Lab 1 Constructing a Logic Probe
Lab 3 Number Systems
Lab 4 Logic Gates
Lab 5 Boolean Laws & DeMorgan's Theorem
Lab 6 Logic Circuit Simplification
Lab 7 The Perfect Pencil Machine –Design
Lab 8 The Perfect Pencil Machine - Build and Demo
Lab 9 Adder and Magnitude Comparator
Lab 10 Combinational Logic Using Multiplexers
Lab 11 Combinational Logic Using Demultiplexers
Lab 12 The D Latch and D Flip-Flop
Lab 13 The J-K Flip-Flops

Relationship of this Course to Program Objectives
Please refer to the “Objectives Matrix” in Appendix A.

Prepared by: Ray Bachnak Date: Spring 2003
Texas A&M University–Corpus Christi  
College of Science and Technology  
Engineering Technology

Course Number and Title: ENTC 3444 Principles of Measurements

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 3415 Circuit Analysis II

Course Description:
Fundamental principles and methods of measurements and control; characteristics of sensors and transducers; electronic devices; signal conditioning; flow, temperature, pressure, force, level, and motion measurements.

Textbooks

Course Objectives

This course is designed to enable students to:
- Model a feedback control system.
- Use common semiconductor components/devices such as transistors, diodes, voltage regulators, waveform generators, etc.
- State the principles of measuring devices and describe how they work.
- Identify linear and nonlinear components and systems.
- Design and analyze op-amp circuits; Design signal conditioning circuits.
- Design and analyze analog-to-digital converter circuits.
- Design and analyze digital-to-analog converter circuits.
- Describe various techniques/methods for measuring temperature, level, flow, pressure, force, displacement, and motion.
- Design and analyze sensor-based circuits for measurement and control.

Assessment

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</table>
Topics Covered

Introduction to measurements and control, Diode circuits, Transistor fundamentals, Electronic devices: JFETs, voltage regulators, comparators, waveform generators, Common elements of system components, Measuring instrument characteristics, Op-Amp circuits, Signal conditioning, Data sampling and conversion, Position, motion and force measurements, Temperature and flow measurements, Pressure and level measurements, Representation and display of data, Selecting sensors, Sensor specifications.

Laboratory Exercises/Experiments*:
Lab 1  Diode Characteristics
Lab 3  Approximating Diode Characteristics with Equations
Lab 4  Transistor Characteristics and Circuits
Lab 5  First Order and Second Order Dynamic Systems with Operational Amplifiers
Lab 6  Frequency and Transient Responses of First and Second Order Dynamic Systems
Lab 6  High Voltage Level Indicator Circuit
Lab 7  Inverting Op-Amp Circuit and Voltage Gain Control
Lab 8  Part I: Designing a Analog to Digital Conversion Circuit
Lab 9  Part II: Building and Testing a Analog to Digital Circuit
Lab 10 Part I Designing a Digital to Analog Circuit
Lab 11 Part II Building and Testing a Digital to Analog Circuit
Lab 12 Part I Designing a ON/OFF Temperature Control Circuit
Lab 13 Part II Building and Testing a ON/OFF Temperature Control Circuit

* New experiments that utilize recently acquired equipment will be developed in the future

Relationship of this Course to Program Objectives
Please refer to the “Objectives Matrix” in Appendix A.

Prepared by: Ray Bachnak                Date: Spring 2003
Course Number and Title: ENTC 4315 Project Justification and Management

Weekly Schedule: 3 hours lecture

Prerequisites: PHYS 2425 University Physics I and MATH 2414 Calculus II

COURSE INFORMATION
Meeting Time: Monday Wednesday 5:30-7:45 PM
Meeting Place: Center for Instruction Room 229

COURSE DESCRIPTION
Project justification using payback, ROI, present value, discounted cash flow. Introduction to project management, use of project management software, GANTT charts, PERT charts, critical path.

PREREQUISITES
Junior classification.

TEXTS AND OTHER SUPPLIES

COURSE OBJECTIVES
This course is designed to enable students to:
- Become project managers at some point in their careers.
- Aquatint the student with the terminology, tools, and procedures that are used to plan, schedule and track projects.

EVALUATION AND GRADE ASSIGNMENT
Grades will be determined as follows:

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<td>Exam 2</td>
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<td>Reports/participati</td>
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<td>Final Exam</td>
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Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Tim Coppinger  Date: Fall 2002
Course Number and Title: ENTC 4320 Heat Transfer

Weekly Schedule: 3 hours lecture

Prerequisites: ENTC 3406 Fluid Mechanics and Fluid Power

Course Description:
The fundamentals of convection, conduction, & radiation are covered. Their application to heat transport, heat exchangers, and other heat transfer mechanisms are also covered. These heat transfer mechanisms are then summarized at the end of the course with the cooling of electronic equipment.

Textbooks

Course Objectives
This course is designed to enable students to:
- Gain an intuitive understanding of heat transfer mechanisms
- Communicate the mechanisms for heat transfer to their peers.
- Use diagrams, tables, & equations to analyze, understand & solve heat transfer problems
- Write complete & logical solutions to problems and present them to the class
- Have a basic knowledge to prepare for the heat transfer portion of the E.I.T. Exam.
- Calculate the time needed to heat a solid to a specified temperature
- Calculate the rate of heat transfer through a wall that has layers of different materials
- Calculate the heat transfer from finned surfaces
- Calculate the critical radius for an insulated pipe
- Determine the heat transfer coefficient of heat exchangers
- Size a heat exchanger
- Calculate the radiation impact on surfaces
- Determine the cooling rate of various electrical equipment designs
Assessment

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Topics Covered
Conduction, thermal diffusivity, thermal resistance networks, conduction in cylinders & spheres, critical radius, finned surfaces, lumped systems, Biot number, Fourier number, transient heat conduction, Schmidt Plot, forced convection, Nusselt number, Prandtl number, thermal boundary layer, logarithmic mean temperature, natural convection, Grashof number, Rayleigh number, radiation, blackbody radiation, Stefan-Boltzmann law, Planck’s distribution law, Wien’s displacement law, emissivity, absorptivity, reflectivity, transmissivity, Kirchhoff’s law, black surfaces, gray surfaces, heat exchangers, heat transfer coefficient, fouling factor, co-current & counter-current exchangers, multipass exchangers, cooling of electric equipment,

Laboratory Exercises/Experiments: (proposed for future)
Lab 1 Transient heat conduction through a solid
Lab 2 Solar heating
Lab 3 Analyze the performance of a co-current and a counter-current heat exchanger

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Larry White
Date: Fall 2002
Course number and title: **ENTC 4322 Programmable Logic Controllers**

**Weekly Schedule:** 3 hours lecture and 3 hours laboratory

**Prerequisite:** ENTC 3416, ENTC 3444

**Course description:**
Relay and ladder logic leads to the study of the Programmable Logic Controllers used in current industrial automation; counters, timers, and other functions are explored.

**Textbooks**


**Course Objectives**
This course is designed to enable students to:
- State the major components and features of PLCs.
- Select the proper PLC for a given application.
- Differentiate between digital, analog, and intelligent I/O modules.
- Use a PLC instruction set and addressing modes to write IEC 1131-3 programs
- Program a PLC for various applications, including counters, timers, and process control applications.
- Interface I/O devices to a PLC.
- Install and configure a PLC.
- Differentiate between PLCs and robot controllers.

**Assessment**

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Topics covered:
PLC principles of operation, PLC size and applications, the I/O section, discrete I/O modules, analog I/O modules, I/O specifications, the CPU, memory types and design, programming devices, number systems and codes, fundamentals of logic, the binary concept, basic logic functions, Boolean algebra, hard-wired vs. programmed logic, basics of PLC programming, processor memory organization, program scan, PLC programming languages, instruction addressing, internal relay instructions, modes of operation, examine if closed and examine if open instructions, manually and mechanically operated switches, transducers and sensors, output control devices, seal-in circuits, latching relays, programming PLC timers, on-delay and off-delay timers, retentive timers, programming PLC counters, up and down counters, master control and zone control instructions, jump instructions and subroutines, immediate input and output instructions, forcing external I/O addresses, data transfer instructions, data compare instructions, data manipulation programs, math instructions, sequencer instructions, shift register instructions, PLC installation and troubleshooting.

Laboratory Exercises/Experiments:
Lab 1 Introduction to lab equipment and Siemens PLC
Lab 2 Introduction to Siemens PLC software
Lab 3 Creating and debugging a PLC Program
Lab 4 Downloading and running a PLC program
Lab 5 PLC program using switches
Lab 6 PLC program using seal-in concept
Lab 7 PLC program using timers
Lab 8 PLC program using counters
Lab 9 PLC program using control instructions
Lab 10 PLC program using math instructions
Lab 11 PLC lab project
Lab 12 PLC lab project
Lab 13 PLC lab project
Lab 14 PLC lab project

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Hesham Shaalan  Date: Fall 2002
Course Number and Title: ENTC 4334 Design of Machine Elements

Weekly Schedule: 3 hours lecture

Prerequisites: ENTC 3332 Design of Machine Elements II

COURSE DESCRIPTION
Design for different types of loading, modes of failure, columns, springs, tolerances and fits, shaft design, computer aided design, and engineering applications.

PREREQUISITES: ENTC 3332

TEXTS AND OTHER SUPPLIES
2. Engineering Pad
3. Good Scientific Calculator

COURSE OBJECTIVES
This course is designed to enable students to:
- understand stress, strain and simple combined stresses
- apply the appropriate design procedures for various types of loading and materials
- size and select the appropriate type gears for various types of power transmission
- size and select the appropriate type bearings with rolling contact for various types of power transmission
- design concentric drive shafts
- apply the appropriate design techniques to the solution of a mechanical problem
- document their designs in written, graphical and oral forms

EVALUATION AND GRADE ASSIGNMENT
- One hour exams (2@15%) 30%
- Final Exam (Comprehensive) 15%
- Homework & Daily assignments 25%
- Project Design solution 25%
- Employability Factor 5%

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Tim Coppinger  Date: Fall 2002
Course Number and Title: ENTC 4348 Structural Steel Construction

Weekly Schedule: 3 hours lecture

Prerequisites: ENTC 3316 Strength of Materials

COURSE DESCRIPTION
Function of structures, analysis of statically indeterminate structures, application of the AISC Code to calculations and selection of structural steel members.

PREREQUISITES
ENTC 3316. Strength of Materials

TEXTS AND OTHER SUPPLIES

COURSE OBJECTIVES
This course is designed to enable students to:

- develop an understanding of the Steel Construction Industry
- evaluate design criteria, and implement ASD
- read and develop construction documents (drawings and specifications) as they relate to steel construction

EVALUATION AND GRADE ASSIGNMENT
3 exams @ 20% each = 60%
Homework = 20%
Semester Project = 20%

HOMEWORK ASSIGNMENTS & THE SEMESTER PROJECT
Homework should be done in a neat and orderly manner, and should be organized such that corrections can be made in the margins or in between lines of calculations. Intermediate steps in the calculations should be shown so that the Instructor can follow the thought process of the student. Each student will be expected to review their graded homework, and make appropriate corrections. The homework assignments will be treated in much the same manner that design calculations are treated in an engineering office – the design calculations are checked, and if errors are found, they are corrected prior to implementing the design results into the design documents.
The Semester Project will require that each student design a steel building structure, and convey the design via drawings and specifications. The Project will be due on the last day of class. The homework assignments will be tailored to the individual design tasks required for the building. The Semester Project will use copies of the “corrected” homework assignments as the basis for the information placed on the drawings and specifications. Thus, the review and correction of errors in the homework serves two purposes – one, to help the student better understand the design process, and two, to insure that the Semester Project is a well-documented design.

**Relationship of this Course to Program Objectives**
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

**Prepared by:** Arthur Colwell  
**Date:** Fall 2002
Texas A&M University-Corpus Christi
College of Science and Technology
Engineering Technology

Course Number and Title: ENTC 4349 Reinforced Concrete Construction

Weekly Schedule: 3 hours lecture

Prerequisites: ENTC 3316 Strength of Materials

Course Description
Design and Construction of reinforced concrete members according to the ACI building codes.

Textbooks and other supplies

Course Objectives
This course is designed to enable students to understand the:
- Material properties of concrete
- Design criteria used for beams, slabs and columns
- Construction process for concrete structures

Assessment
Attendance 10%
Homework and daily assignments 15%
2 Examinations, 15% each 30%
Project 30%
Final Exam 15%

Topics Covered
Introduction and concrete, reinforced concrete, flexure in beams, shear & diagonal tension in beams, serviceability of beams and one-way slabs, design of one-way slabs, columns, bond development of reinforcement bars, two-way slabs and plates, footings, concrete retaining walls, calculate the PVR of given soil condition, slab-on-grade foundations (types and method), and post-tensioned slab-on-grade foundation.

Relationship of this Course to Program Objectives
Please refer to the “objectives Matrix” in Appendix A.

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by: Harish Shah        Date: Fall 2002
Course Number and Title:  ENTC 4350 Capstone Projects

Weekly Schedule:  3 credit hours

Prerequisites:  This course is to be taken in the student’s final long semester before graduation.

Course Description
Industrial firms will submit projects that will be assigned to teams of students; proposals, written documentation, and oral presentations will be made to the industrial sponsor.

Textbooks and other Supplies

1. There is no formal textbook for this course. The student is to refer to the texts used in other courses, library and other reference materials as appropriate to the assigned project.

COURSE OBJECTIVES

- Apply the totality of their education to solve an industrial project in an interdisciplinary team format.
- Become confident in their abilities to solve problems and communicate effectively in the industrial environment
- Understand the broader aspects of their technological education such as: the need for life long learning, understand their professional, ethical, and social responsibilities, and be cognizant of contemporary professional, societal, and global issues.

Assessment

10%  Ability to work as a team, employability factor
10%  Progress report, internal documentation, and other written communication
10%  Written and oral reports presented to the class concerning issues and topics not directly related to the project.
30%  Final project solution
20%  Final written report and documentation
20%  Final Oral presentation to industrial sponsor

The feedback from the industrial sponsor along with the final presentation and report will serve as the final exam for this course.
Topics Covered
Teams formed and project assigned. Students will meet the industrial sponsor, tour facility, gain first hand knowledge of problem. Written progress report including timeline is presented to the sponsor to insure that the problem is completely understood. Preliminary solution or method of attack discussed with sponsor. Oral and written project solution presented to the industrial sponsor on the TAMU-CC campus.

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.

Prepared by:  Tim Coppinger  Date:  Fall 2002
Course Number and Title: ENTC 4418 Microprocessors and Microcontrollers

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 3415 Circuit Analysis II and ENTC 3416 Digital Logic

Course Description:
Introduction to microprocessor and microcontroller architecture, programming, and interfacing. Topics include addressing modes, instruction set, I/O operations, interrupts, timing, memory, peripheral interface devices, control of external devices, and an overview of advanced microprocessors and microcontrollers.

Textbooks

Course Objectives
This course is designed to enable students to:
- State the major features of the 8051, 8088/86, 80286, 80386, 80486, and Pentium.
- Use the 8086/8051 addressing modes and instruction set.
- Write assembly language programs.
- Use DOS and BIOS interrupt services.
- Differentiate between the minimum and maximum modes.
- Create memory mapped I/O ports.
- Read/write from/to input/output ports.
- Program the 8051 for serial data communication.
- Design microprocessor and microcontroller interface circuits.

Assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Points</th>
<th>If</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quiz</td>
<td>5</td>
<td>90 ≤ Total &lt; XX</td>
<td>A</td>
</tr>
<tr>
<td>Midterm 1</td>
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<tr>
<td>Midterm 2</td>
<td>20</td>
<td>70 ≤ Total &lt; 80</td>
<td>C</td>
</tr>
<tr>
<td>Lab Experiments</td>
<td>20</td>
<td>60 ≤ Total &lt; 70</td>
<td>D</td>
</tr>
<tr>
<td>Homework</td>
<td>10</td>
<td>xx ≤ Total &lt; 60</td>
<td>F</td>
</tr>
<tr>
<td>Final</td>
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<tr>
<td>Total</td>
<td>100</td>
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</tr>
</tbody>
</table>
Topics Covered
Intro to microprocessors/ microcontrollers, Software model of the microprocessor, Memory segmentation/address space, Debugging programs, Instruction set/ addressing modes
Assembly language programs, Microprocessor/microcontroller programming, Microprocessor/microcontroller programming, Microprocessor hardware characteristics, Memory and I/O interfaces, Input/output interface circuits, Interrupt interface of the 8086/88, 8051 I/O port programming, 8051 addressing modes, 8051 serial communication, 8051 real-world interfacing.

Laboratory Exercises/Experiments:
Lab 1 The Debug Commands and Hex Code
Lab 2 Compiling and Building Executable Files
Lab 3 Addressing Modes
Lab 4 Programming and Procedures
Lab 5 Calculating the Average of Signed Numbers
Lab 6 Multiplication of Signed Numbers
Lab 7 Replacing the PC Power Supply, floppy disk drive, and hard disk drive
Lab 8 PC motherboard and features of the microprocessor, RAM, and ROM chips
Lab 9 Design and programming of a 6821 interface circuit
Lab 10 Using INT 10H and INT 21H software interrupt functions
Lab 11 Accessing the Printer Parallel Port on a PC
Lab 12 Microcontrollers in interfacing applications

Relationship of this Course to Program Objectives
Please refer to the “Objectives Matrix” in Appendix A.

Prepared by: Ray Bachnak Date: Spring 2003
Course Number and Title: ENTTC 4446 Control Systems I

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 3444 Principles of Measurements and MATH 3315 Differential Equations

Course Description:
An introduction to control systems; open and feedback control; Laplace transform and frequency response; control valves; electric motors; P, PI, and PID modes of control; analog and digital controllers; process characteristics; analysis of control systems; gain and phase margin; stability; controller design methods.

Textbooks


Course Objectives
This course is designed to enable students to:
- Mathematically model a feedback control system.
- Derive the transfer function of a control system.
- Plot and interpret frequency responses.
- Contrast quick-opening, linear, and equal percentage control valves.
- Apply control valve sizing techniques to select the proper size for given specifications.
- Differentiate between induction, synchronous, and servo motors.
- Differentiate between the various configurations of DC motors.
- Analyze stepping motor configurations.
- Compare the characteristics and applications of the P, PI, PID modes of control.
- Analyze and design analog controller circuits.
- Analyze digital control algorithms.
- Examine the characteristics of a number of processes, such as integral, first-order lag, and second-order lag and analyze operations of such systems.
Assessment

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<td>Lab exercises/reports 05</td>
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<td>Quiz 04</td>
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<td>Midterm 1 15</td>
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<td>Midterm 2 15</td>
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<td>Draft of project research paper 02</td>
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<td>Project research paper 05</td>
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<td>Project progress report 02</td>
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<td>First project presentation 02</td>
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<td>Project report/presentation/demo 20</td>
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<tr>
<td>Final 25</td>
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</tr>
<tr>
<td>Total 100</td>
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<td></td>
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</tbody>
</table>

Topics Covered
Block diagrams and transfer functions, open-loop control, closed-loop control, nonlinearities, benefits of automatic control, objectives of good control, block diagram simplification, analog and digital control, regulator and follow-up systems, process control, servomechanisms, sequential control, the evolution of control systems, Laplace transforms, inverse Laplace transforms, transfer functions, frequency response, Bode plots, relays, motor starters, solid-state switching devices, solenoid valves, cylinders, control valves, control valve control characteristics, valve sizing, induction motors, synchronous motors, servomotors, DC motors, stepping motors, ac adjustable-speed drives, dc motor and drives, two-position control mode, floating control mode, proportional control mode, integral control mode, PI control mode, derivative control mode, PD control mode, PID control mode, analog controllers, digital controllers, integral or ramp process, first-order lag process, second-order lag process first-order lag plus dead-time process, open loop Bode diagrams, closed-loop Bode diagrams, stability, gain and phase margins, Nyquist plots, root locus.

Laboratory Exercises/Experiments:
Lab 1 MATLAB Getting Started (Part I); Lab 2 MATLAB Getting Started (Part II)
Lab 3 Writing MATLAB programs and Use of Functions
Lab 4 Wireless Data Logging and Processing
Lab 5 Time domain response and unit-step response of Closed-loop Systems
Lab 6 Control System Analysis Using Simulink
Lab 7 Process System Components: Centrifugal Pump, Valves, and Flow Gauges
Lab 8 Calibration of System Components: Flow Meter, Servo valve, and Solenoid Valve
Lab 9 Interfaces: Circuit Breaker, Servo Valve, and I/V Converters
Lab 10 Interface Calibration and Controller Familiarization
Lab 11 Bode Plots, Nyquist Plot, and Root Locus
Lab 12 Controller Calibration; Lab 13 Float Level Transmitter

Relationship of this Course to Program Objectives
Please refer to the “CSET/MET Program Outcome Matrices” in Appendix A.
Prepared by: Ray Bachnak Date: Spring 2003
Course Number and Title: ENTC 4448 Control Systems II

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 4446 Control Systems I

Course Description:
Continuation of Control Systems I: Control systems design; controller mode selection; control loop tuning; data acquisition systems; distributed control systems; supervisory control; data transmission; networks; analysis and specification of complete control systems.

Textbooks


Course Objectives
This course is designed to enable students to:
- Specify and design multi-loop control systems.
- Apply control loop tuning methods.
- Apply control concepts to the operation of automatic control systems.
- Describe the use and operation of distributed control systems (DCS) and supervisory control for the control of manufacturing and processing systems.
- Design and develop data acquisition systems for process and industrial applications.
- Apply the concepts of fuzzy logic to control applications.
- Characterize the media used to communicate control loop signals and describe the use of fieldbus for process control.
- Use LabVIEW for measurements, virtual instrumentation, and instrument control programming.
Assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Points</th>
<th>If</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
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<td>A</td>
</tr>
<tr>
<td>Lab exercises/reports/posttests</td>
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<td>Quiz</td>
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<td>Midterm 1</td>
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</tr>
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<td>Midterm 2</td>
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<td>First project presentation</td>
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<tr>
<td>Total</td>
<td>100</td>
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</tr>
</tbody>
</table>

Topics Covered
Cascaded systems, LabVIEW basics, Ratio control, Feedforward control, Virtual instruments, Multi-variable process control, Override and selective control, Editing and debugging virtual instruments, Self-tuning adaptive controllers, Tuning of feedback controllers, Controller design, Design of multi-loop control systems, Structures, Fuzzy logic controllers, Supervisory control, Arrays and clusters, Networks, Fieldbus for process control, Distributed control systems, Charts and graphs, Data acquisition systems, Pneumatic control, Analytical devices: analyzers.

Laboratory Exercises/Experiments:

<table>
<thead>
<tr>
<th>LabVIEW Programming</th>
<th>Exercises/experiments</th>
<th>Training CDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabVIEW basics</td>
<td>Pulse flow transmitter</td>
<td>Single loop control</td>
</tr>
<tr>
<td>Virtual instruments (VIs)</td>
<td>On/Off Control</td>
<td>Tuning loops</td>
</tr>
<tr>
<td>Editing and debugging VIs</td>
<td>Proportional Control: Level</td>
<td>Pneumatic control</td>
</tr>
<tr>
<td>SubVIs</td>
<td>Proportional Control: Flow</td>
<td>Introduction to DCS</td>
</tr>
<tr>
<td>Programming with Structures</td>
<td>PI and PID: Level Control</td>
<td>Networks</td>
</tr>
<tr>
<td>Arrays and clusters</td>
<td>PI and PID: Flow Control</td>
<td>Field devices: analytical</td>
</tr>
<tr>
<td>Charts and graphs</td>
<td>Tuning PID Controllers</td>
<td></td>
</tr>
<tr>
<td>Data acquisition and control</td>
<td>Building a DAQ System</td>
<td></td>
</tr>
</tbody>
</table>

Relationship of this Course to Program Objectives
Please refer to the “Objectives Matrix” in Appendix A.

Prepared by: Ray Bachnak
Date: Spring 2003
e. Time devoted to curricula components

The Engineering Technology program curricula is constrained by The Texas Higher Education Coordinating Board, A&M Corpus Christi’s Core curriculum and the ABET General and Program Criteria.

The Texas Higher Education Coordinating Board requires a general education core curriculum. The 46-48 semester hour A&M Corpus Christi Core Curriculum complies with this requirement. The Texas Education Code also requires that 32-35 hours of Engineering Technology (Field of Study) course be accepted from other colleges and universities. The Engineering Technology curriculum and procedures comply with these requirements. The University requires that all programs have a minimum of 45 upper division hours. The Control Systems Engineering Technology curriculum requires 52 upper division hours and 66 hours of technical content. The Mechanical Engineering Technology curriculum requires 46 upper division hours and 71 hours of technical content.

The Control Systems Engineering Technology degree requires a total of 130 semester hours that are distributed as follows: communications 11, mathematics 14, physical and natural sciences 12, social science and humanities 27, and technical content 66 hours. There is a total of 52 hours taught at the junior or senior level.

The Mechanical Engineering Technology degree requires a total of 132 semester hours distributed as follows: communications 11, mathematics 11, physical and natural science 12, social sciences and humanities 27, and technical content 71. There is a total of 46 hours taught at the junior or senior level.

The allocation of time among general education courses, technical courses, upper division and lower division is appropriate based on the stated outcomes if the program.

f. Competencies in communications and mathematics

Beginning with the University’s award winning freshman program the students are required to work in teams to develop their interpersonal skills, prepare written papers and reports, and to make oral presentations. Additional skills are gained in COMM 1315 Public Speaking, a Core Curriculum requirement. This commitment to the importance of communication carries through all of our technical courses. At the freshman level in Engineering Design Graphics 1, the students are required to develop their communication skills by working together as a team to solve a design problem, preparing drawings, a written report, and making an oral presentation. The same is required in ENTC 4350 Capstone Projects in much greater detail. The concept of written reports based on laboratory experiments or research will be found in most of the courses in the curriculum.

All Engineering Technology students are required to complete two courses (MATH 2413 and MATH 2414) that cover integral and differential calculus. Additionally the Control Systems Engineering Technology students are required to take differential equations, MATH 3315. The use of the concepts taught in these courses will be found ENTC 2403 Statics and Dynamics, ENTC 3316 Strength of Materials, ENTC 3406 Fluid Mechanics, ENTC 4446 Control Systems 1, and in other courses where appropriate.

g. Cooperative Education

Students may take ENTC 4197 Coop/Internship for one-hour credit per semester work term with a limit of 3. Upon the satisfactorily completing three work terms the students will be allowed to substitute the credit for one technical elective in the Mechanical Engineering Technology curriculum. In the Control Systems Engineering Technology curriculum no substitution credit will be given. The course will appear on the student’s transcript and participation in an internship/coop program is highly encouraged by the faculty.
h. Additional materials available

A display of student work will include examples of course work to include videotape of student oral presentations.

3. Faculty

The Engineering Technology curriculum has been developed to be served by 5-6 full time faculty equivalents. There are four full time faculty plus 3-5 adjunct professors each semester. This faculty will cover the 16 courses offered each fall and the 17 courses offered in the spring semester. This level of course offering allows for each course to be offered once per year and the freshman introductory courses to be offer each fall and spring.

Beyond the general education core curriculum the Engineering Technology curriculum have 59 hours of common technical courses some of which overlap with the general education core requirements. Of the 59 course hours the mathematics, chemistry, physics and management faculty teach 26 hours. The Engineering Technology faculty teaches 33 hours of Engineering Technology courses that are common to both programs. They are also responsibility for the 31 hours of program specific course hours in the Mechanical engineering Technology and 26 hours in the Control Systems Engineering Technology area. The current staffing level is appropriate.

Faculty members are expected to teach both the lecture and laboratory portions of their course. This limits their full time load to approximately 3 courses. Their Work Load Summary is shown in Table 3.

The Faculty Summary Vita

J. TIM COPPINGER
Professor, Engineering Technology Coordinator
Texas A&M University-Corpus Christi

EDUCATION:
B.S., Mechanical Engineering, Texas A&M University, 1965
M.S., Mechanical Engineering, Texas A&M University, 1967
D.E.D., Environmental Design, Texas A&M University, 1975

ACADEMIC EXPERIENCE: 35 Years
Texas A&M University-Corpus Christi, 6 years, 1997-present
Engineering Technology Coordinator,
Texas A&M University, 29 years, 1968-1997
Engineering Technology Department, 1985-1997
Coordinator of the Mechanical Engineering Technology Program, 1985-1987
Engineering Design Graphics Department 1968-1985
Professor, 1980-1997
Appointed to the Graduate Faculty, 1976
Associate Professor, 1975-1980
Assistant Professor, 1968-1975

INDUSTRIAL EXPERIENCE: 5 Years
Automation Engineer, IBM, Industrial Systems Division, 9/90-12/90
Visiting Engineer, Southwest Research Institute, 6/90-8/90
Field Engineer, City of College Station, 7/80-8/80
Plan Checker, City of College Station, 7/79-8/79
Project Engineer, Instrumentation & Special Devices Group, Hughes Tool Co. Oil Tool Division, 1965-1968
Numerous consulting positions
PROFESSIONAL LICENSES:
Registered Professional Engineer, TX No. 29499, 1969
Certified Manufacturing Engineer, Robotics No. 1922326, 1989
Licensed Peace Officer, Master Peace Officer Certificate, Texas Commission on Law Enforcement Officer Standards and Education, 1995
Master Electrician, Cities of Pearland, Friendswood and Alvin, Texas, 1970

SCIENTIFIC AND PROFESSIONAL SOCIETIES:
American Society of Engineering Education, 1968-present
American Society of Mechanical Engineers, 1985-present
ISA-The International Society for Measurements and Controls, 1996-date
Society of Manufacturing Engineers, 1985-date,
SME Robotics Institute of America, 1986-date
SME Computer and Automated Systems Assoc., 1986-date

RECENT HONORS, AWARDS, PUBLICATIONS
"Why CIM?", Coppinger and Steidley, ASEE Annual Conference, Albuquerque, June 25, 2001

Institutional and professional service in the last three years
American Society of Mechanical Engineers, 1985-present
Accreditation Board for Engineering and Technology Program Evaluator, June 2000-present
Chairman, South Corpus Christi, 2000-2001
Vice Chair, South Texas Section, 1999-2000
ISA-The International Society for Measurements and Controls, 1996-date
TAC-ABET Commissioner Alternate 2002
Chair-Elect South Texas Chapter 2001-2002
Vice Chair South Texas Section 2000-2001
Acting Treasurer South Texas Section 2000-2001
Educational Committee Chairman South Texas Section, 1997-date
Society of Manufacturing Engineers, 1985-date,
International Director SME, 1997-2001
Work Group on Chapters and Regions, July-November, 2001
International Officer Nominating Committee, 1999, 2000
Audit Chairman, Region 11, 2001

RECENT UNIVERSITY ACTIVITIES:
Search Committee for Assistant Physical Plant Director, 9/02-12/02
Faculty Search Committee Control Systems Engineering Technology, 10/01-5/02
Faculty Search Committee Mechanical Engineering Technology, 10/01-5/02
Building Coordinator, Science &Technology Building, 2001-date
Freshmen Core Curriculum Advisor, 1/98-date
Facilities Use and Event Management Committee, 1999-2001
SIS Operations Council, 1999-2001
User Coordinator, Science and Technology Building, Project 15-2833, 1997-2001
College of Science and Technology Promotion and Tenure Committee, Chairman, 1998-1999, Member 2000-2002
Computer and Mathematical Sciences Departmental Promotion & Tenure Committee, Chairman, Sept.99-Sept. 2000

Professional development activities in the last three years
“ABET Evaluator TC2K Update”, ANS, Washington, D.C., 11/2/02
“Autodesk Update Training”, workshop, 12/02
“Chapter Officials Conference”, Society of Manufacturing Engineers, Austin, TX, 11/1/02-11/3/02
“How to Handle Difficult People”, workshop, 5/6/02
“Public Information”, workshop, 8/14/02
“Introductory FAMIS Training”, 9/11/02
“Post Award Video Conference”, 9/24
“Procurement Card Training”, 10/2/02
“Embedded Assessment Workshop”, Texas Christian Workshop, 10/23/02
“Advisor’s Update Training”, 10/30/02
“ABET Evaluator Training”, Washington, D.C, 11/15/02-11/17/02
“Managing Diverse Cultures”, TAMUCC, 11/12/02
“Developing Winning Proposals”, DoD Technical Assistance Program, 11/14/02
“WebCT Workshop” 8/6/01, TLC, A&M-CC
“Presenter training for the Texas Scholars Program”, Corpus Christi Chamber of Commerce, 11/27
“WebCT Update”, 12/4/01
“Four Roles of Leadership”, 11/30/01, 12/7/01, 12/14/01
“Adobe Photo Shop Workshop,” Center for Teaching Excellence, TAMUCC, 11/10
“ASME TAC-ABET Program Evaluator Workshop,” ASEE Conference, St. Louis, 6/19/00
"Overcoming the Limits to Project Management Success," Coastal Bend Business Roundtable Current Issues Breakfast Forum, 11/2/00

RAFIC (RAY) BACHNAK
Associate Professor Control Systems Engineering Technology
Texas A&M University-Corpus Christi

EDUCATION
Ph.D. in Electrical and Computer Engineering, November 1989, Ohio University
M.S. in Electrical and Computer Engineering, November 1984, Ohio University
B.S. in Electrical Engineering, March 1983, Ohio University

ACADEMIC EXPERIENCE
TEXAS A&M UNIVERSITY–CC, Corpus Christi, Texas
Associate Professor of Engineering Technology, 9/98-present
NORTHWESTERN STATE UNIVERSITY, Natchitoches, Louisiana
Associate Professor of Electronics Engineering Technology, 8/97-8/98
FRANKLIN UNIVERSITY, Columbus, Ohio
Professor of EET, 9/90-8/97, Chairperson, EET Program, 9/91-8/97
FRANKLIN UNIVERSITY, Columbus, Ohio, Adjunct Professor, 4/90-8/90
OHIO UNIVERSITY, Athens, Ohio, Teaching Associate/Teaching Assistant, 4/83-11/89
HOCKING TECHNICAL COLLEGE, Nelsonville, Ohio, Part Time Instructor, 3/87-6/87

INDUSTRIAL/PROFESSIONAL EXPERIENCE
JOHNSON SPACE CENTER, Houston, Texas, Faculty Fellow, 5/02-8/02
Naval Air Warfare Center, Patuxent River, Maryland, Faculty Fellow, 5/01-7/01
Naval Air Warfare Center, Patuxent River, Maryland, Faculty Fellow, 5/00-7/00
KOCH PETROLEUM GROUP, Corpus Christi, Texas, Reliability Engineer, 6/99-8/99
JOHNSON SPACE CENTER, Houston, Texas, Faculty Fellow, 6/98-8/98
JOHNSON SPACE CENTER, Houston, TX, Faculty Fellow, 5/96-8/96  
ALPHA ENGINEERING, Lebanon, Senior Project Engineer, 8/94-12/94  
AKB ELECTRIC, Lebanon, Electrician, 6/78-8/79.

PROFESSIONAL REGISTRATION  
Professional Engineer, TX, No. 85138

ACTIVE MEMBERSHIP IN PROFESSIONAL AND SCIENTIFIC SOCIETIES  
The American Society for Engineering Education (ASEE), 1992-present  
The Institute of Electrical & Electronics Engineers (IEEE), 1985-present  
The Instrumentation, Systems, and Automation Society (ISA), 1998-present  
Sigma Xi, South Texas Chapter, 1999-present

HONORS, AWARDS, PUBLICATIONS IN 2002  


INSTITUTIONAL AND PROFESSIONAL SERVICE IN 2002  
Texas A&M University-Corpus Christi: Chair of the Educational Technology Committee (8/02-present), serving on the “NSF-CAMS Scholars Review/Awards Committee,” 3/01-present, chaired the Engineering Technology Search Committee (8/01-5/02); served on the “Advisory Committee of the Coastal Bend Science Fair,” 9/01-5/02; served on the Educational technology Committee (9/01-8/02); served on CAMS Assessment Committee (4/01-9/02); served on “CAMS Promotion and Tenure Committee,” 9/01-9/02; co-chaired the Teaching, Learning, and Technology Roundtable (3/00-9/02); advised the Engineering Technology Society (ETS) at A&M-CC (11/98-9/02).  
The American Society for Engineering Education  
Chair, the Instrumentation Division, 6/02-present  
Program Chair, Instrumentation Division, 2002 ASEE Annual Conference, Montreal, CA
Serving on the Robert G. Quinn Award for Excellence in Engineering Education committee, 6/01-present, 6/01-present
The Institute of Electrical & Electronics Engineers (IEEE)
Vice Chair, IEEE Corpus Christi Section, 1/02-12/02
TAC/ABET program evaluator, 5/00-present.
Sigma Xi, South Texas Chapter
Secretary, Corpus Christi Section, 9/00-7/02.

HESHAM E. SHAALAN, PH.D.
Associate Professor of Engineering Technology
Texas A&M University-Corpus Christi

EDUCATION:
B.S., Electrical Engineering, University of Houston, 1986
M.E.E., Electrical Engineering, University of Houston, 1987
Ph.D., Electrical Engineering, Virginia tech, 1992

ACADEMIC EXPERIENCE: 8 Years
Texas A&M University-Corpus Christi, 1 year, 2002-present
   Associate Professor of Engineering Technology
Georgia Southern University, 5 years, 1997-2002
Assistant Professor of Electrical Engineering Technology, School of Technology
Adjunct Assistant Professor, 1 year, 1996-1997
Electrical Engineering Department, Virginia Tech
Visiting Assistant Professor, 1 year, 1992-1993
Electrical Engineering Department, Mississippi State University

INDUSTRIAL EXPERIENCE: 3 Years
Director of Support & Training Services, July 1994 - June 1997
Electrical Distribution Design, Inc., Blacksburg, Virginia

Professional Licenses:
Preparing application material for Texas license

SCIENTIFIC AND PROFESSIONAL SOCIETIES:
American Society of Engineering Education
Senior member of the Institute of Electrical and Electronics Engineers

RECENT PUBLICATIONS, HONORS, AWARDS,
H. Shaalan, "Using Simulations of Actual Power Distribution Systems as an Educational Tool,"
H. Shaalan and D. Morris, "Using a Microcontroller for Sonar Ranging," Proceedings of the
Certificate of Appreciation from the Savannah Section of IEEE for service as Professional Activities Chair and Student Activities Chair, 2002.
Member, National Honor Society of Electrical Engineers (Eta Kappa Nu).

Institutional and professional service in last five years
Reviewer for the following: Engineering Economist Journal, the Technology Interface Journal, and three IEEE Transactions Journals.
Board of Directors for the Corpus Christi section of IEEE.
Reviewer for the 2003 American Society of Engineering Education conference, and was also selected to be a co-moderator for one session, June 22-25, 2003, Nashville, TN.
Member of the International Program Committee of the 7th IASTED International Conference on Power & Energy Systems, February 24-26, 2003, Palm Springs, California.
Reviewer for the 2002 American Society of Engineering Education conference, and was also selected to be a co-moderator for one session, June 16-19, 2002, Montreal, Canada.
Member of the International Program Committee of the 6th IASTED International Conference on Power & Energy Systems, May 13-15, 2002, Marina del Rey, California. Also served as Session Chairman for session 1.
Member of the International Program Committee of the 5th IASTED International Conference on Power & Energy Systems, November 19-22, 2001, Tampa, Florida. Also served as Session Chairman for session 1.
Member of the International Program Committee of the 4th IASTED International Conference on Power & Energy Systems, September 19-22, 2000, Marbella, Spain. Also served as Session Chairman for session 13.
Session Chairman for session MP2-C in the 4th International Conference on Engineering Design and Automation, July 30 – August 2, 2000, Orlando, Florida.
Executive Committee of the Savannah section of IEEE as Chair of Professional Activities for the years 2000-2002, and Chair of Student Activities for the years 1998-2002.

Professional development activities in the last five years
Attended a Department of Defense/Technical Assistance Program workshop titled “Developing Winning Proposals,” Texas A&M University, Corpus Christi, TX, 2002.
Attended a workshop on Managing Diverse Cultures, Texas A&M University, Corpus Christi, TX., October 11-12, 2002.

SATYAJIT VERMA
Assistant Professor, Engineering Technology
Texas A&M University-Corpus Christi

EDUCATION:
Ph. D., Chemical Engineering, Louisiana State University, Baton Rouge, La. 1980
M.S., Chemical Engineering, Louisiana State University, Baton Rouge, La. 1976
B. Tech., Chemical Engineering, Indian Institute of Technology, Kanpur, India, 1974

ACADEMIC EXPERIENCE: 1 Year
Texas A&M University-Corpus Christi, Tx, Fall 2002 - present
Assistant Professor, Engineering Technology

INDUSTRIAL EXPERIENCE: 22 Years
Celanese Corporation, Bishop, Texas, 1989 – 2002
Senior Process Development Engineer
Developed new technology for manufacturing of polyacetal.
Pilot plant operation, polymerization reaction, purification and melt processing of polymer.
Process optimization.
Reactor modeling and simulation.
Extrusion melt devolatilization of polyacetal.
Residence time distribution model of the manufacturing process.
Neural Network models of the polyacetal manufacturing process to predict and control melt index.
Allied-Signal Corporation, Baton Rouge, Louisiana , 1982 - 1989
Senior Product Development Engineer
Extrusion blow molding of polyethylene.
Blends of nylon and polyethylene that reduced permeability of automobile gas tank.
Evaluated catalysts for polyethylene manufacturing.

Barber & Johnson Consulting Engineers Inc., Baton Rouge, Louisiana, 980 – 1982
Staff Chemical Engineer
Process and instrumentation diagrams, process calculations, design, modifications and troubleshooting of process vessels and equipment.

PROFESSIONAL LICENSES:
Registered Professional Engineer, application in progress
EIT Certification: Louisiana 1/22/80

SCIENTIFIC AND PROFESSIONAL SOCIETIES:
American Institute of Chemical Engineers, 1999 -present

Recent Honors, awards, PUBLICATIONS:
Texas Space Grant Consortium Students Design Challenge: Grant, Spring 2003
Modular Approach to Dynamic Simulation of Processes for Operator Training : Faculty Research Enhancement Grant (applied for).
Desalination of Blends of Brackish Ground water and Sea Water Using RO Membranes: Grant proposal in progress (in conjunction with Center for Water Supply Studies).
Engineering Technology Program at TAMU-CC: HIS Workforce Connections-Links to Regional Prosperity: 3/20/03

PATENTS AWARDED:
EP 999,224A1 May 10, 2000;
Process for the preparation of Polyacetal Copolymers
  - P. Eckardt, M. Hoffmockel, K. F. Mück, G. Reuschel, S. Verma, M. G. Yearwood
US 5,994,455 November 30, 1999
Process for the Preparation of Thermally Stable Polyoxymethylene Copolymer
  - K. F. Mück, H. Röschert, R. M. Gronner, S. Verma, M. G. Yearwood
US 5,962,623 October 5, 1999
Process for the preparation of Polyacetal Copolymers
P. Eckardt, M. Hoffmockel, K. F. Mück, G. Reuschel, S. Verma, M. G. Yearwood
US 5,024,897 June 18, 1991
Blends of Polyamide, Polyolefin, and Ethylene Vinyl Alcohol Copolymer
US 4,950,515 August 21, 1990
Blends of Polyamide, Polyolefin, and Ethylene Vinyl Alcohol Copolymer

RECENT UNIVERSITY ACTIVITIES:
Faculty Advisor: Engineering Technology Society, Fall 2002 – Present.
Professional development activities in the last five years
HIS Workforce Connections-Links to Regional Prosperity: 3/20/03
ASEE 2003 Annual Conference: Reviewer for the Students Learning and Research Section.
Focus on Research, Teaching and Service seminars 8/02 –11/02
Managing Diverse Cultures, TAMUCC, 10/12/02
Faculty Development Seminars Series: 9/02 -11/02
Diversity, Sexual Harassment and Prevention, Ethics: 8/21/02
Respiratory Protection 6/21/02
Six Sigma Process 6/6/02
Hazwoper Awareness 5/7/02
Fine Extinguisher Training 3/5/02
Process Safety Management 10/10/01
Lockout / Tagout 9/5/01
Asbestos 9/4/01
Spill Prevention, Control and Countermeasure 8/29/01
Benzene 8/27/01
Resource Conservation and Recovery Act 8/27/01
Hearing Conservation 8/20/01
Formaldehyde 7/20/01
Principles of Flammability 12/13/00
Risk Assessment, Risk Management Training 3/16/99

Selected Adjunct Faculty summary vita is found in Appendix 1

a. Table 4 Faculty Analysis
<table>
<thead>
<tr>
<th>Name</th>
<th>Rank</th>
<th>FTE</th>
<th>FT or PT</th>
<th>No. Sections Taught</th>
<th>Highest Degree Earned Degree, Year &amp; Institution</th>
<th>Years of Experience</th>
<th>Teaching</th>
<th>This Institution</th>
<th>Professional Registration</th>
<th>Professional Development</th>
<th>Professional Society</th>
<th>Work in Industry</th>
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<tbody>
<tr>
<td>Coppinger, J. Tim</td>
<td>Professor</td>
<td>1</td>
<td>FT</td>
<td>54</td>
<td>D.E.D, Environmental Design, Texas A&amp;M University, 1975</td>
<td>5</td>
<td>35</td>
<td>6</td>
<td>PE, TX</td>
<td>Medium</td>
<td>High</td>
<td>None</td>
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<tr>
<td>Bachnak, Ray</td>
<td>Associate Professor</td>
<td>1</td>
<td>FT</td>
<td>43</td>
<td>Ph.D., EE, Ohio University, 1989</td>
<td>3.5</td>
<td>13</td>
<td>5</td>
<td>PE, TX</td>
<td>High</td>
<td>High</td>
<td>Medium</td>
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<tr>
<td>Shaalan, Hesham</td>
<td>Associate Professor</td>
<td>1</td>
<td>FT</td>
<td>4</td>
<td>Ph.D., EE, Virginia Polytechnic Institute and State University, 1992</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td>Application submitted</td>
<td>Medium</td>
<td>Medium</td>
<td>None</td>
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<tr>
<td>Verma, Satyajit</td>
<td>Assistant Professor</td>
<td>1</td>
<td>FT</td>
<td>6</td>
<td>Ph.D., ChemE, Louisiana State University, 1989</td>
<td>22</td>
<td>2</td>
<td>1</td>
<td>Application submitted</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
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<tr>
<td>Schuler, Karl</td>
<td>Adjunct Professor</td>
<td>0.3</td>
<td>PT</td>
<td>22</td>
<td>Ph.D., Mechanics, Illinois Institute of Technology, 1967</td>
<td>34</td>
<td>5</td>
<td>3</td>
<td>Application submitted</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
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<tr>
<td>White, Larry</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>6</td>
<td>MS, ChemE, Louisiana Technical University, 1973 MS, CE, Memphis State University, 1976</td>
<td>30</td>
<td>2</td>
<td>2</td>
<td>PE, TN</td>
<td>Medium</td>
<td>Low</td>
<td>High</td>
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<tr>
<td>Dalvi, Nandu</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>1</td>
<td>MS, ME, University of Houston, 1970</td>
<td>34</td>
<td>.25</td>
<td>.25</td>
<td>PE, TX</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
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<tr>
<td>Shah, Harish</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>1</td>
<td>MS CE, Texas A&amp;I University, 1989</td>
<td>18</td>
<td>11</td>
<td>0.25</td>
<td>PE, TX</td>
<td>High</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Ochiai, Shinya</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>4</td>
<td>Ph.D., Automated Control, Purdue University, 1966</td>
<td>36</td>
<td>1</td>
<td>1</td>
<td></td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
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<tr>
<td>Colwell, Bud</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>1</td>
<td>MS, Structural Engineering, University of Texas, 1981</td>
<td>21</td>
<td>.25</td>
<td>.25</td>
<td>PE, TX</td>
<td>Medium</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Pratt, Dick</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>8</td>
<td>MBA, Business Administration, 1987 (BSEE)</td>
<td>20</td>
<td>.25</td>
<td>1</td>
<td>PE, TX</td>
<td>High</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Fox, Rafael</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>6</td>
<td>MS, EE, Texas A&amp;M University-Kingsville, 1996</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>EIT</td>
<td>Low</td>
<td>None</td>
<td>High</td>
</tr>
<tr>
<td>Calloway, Randall</td>
<td>Adjunct Professor</td>
<td>0.25</td>
<td>PT</td>
<td>4</td>
<td>MS, ME, University of Houston, 1981 MBA, Business Administration, Corpus Christi State University, 1988</td>
<td>25</td>
<td>1.5</td>
<td>1.5</td>
<td>PE, TX, LA</td>
<td>Low</td>
<td>None</td>
<td>High</td>
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<tr>
<td>Honeycutt, Don</td>
<td>Adjunct Professor</td>
<td>.25</td>
<td>PT</td>
<td>2</td>
<td>BSME, Texas A&amp;M University</td>
<td>35</td>
<td>3</td>
<td>1</td>
<td>PE, TX</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>
b. Faculty Background and Competencies

The Engineering Technology faculty is comprised of four full time professors and the necessary number of adjunct professors to cover the breadth and depth of the curricula. There are two full time faculty members dedicated to each program. Adjunct professors provide valuable knowledge of the working of the local process industries.

Dr. Coppinger has a very broad background. His education includes BS and MS degrees in mechanical engineering and a doctor of Environmental Design Degree. His industrial experience includes mechanical design, manufacturing, automation, electronics, electrical power, and construction. He had 5 years of industrial experience and 35 years of teaching experience. He has the experience to teach most of the courses in the Mechanical Engineering Technology curriculum and several in the control systems area. He developed the original curricula and began the programs with no students and no facilities in January 1997. He is the Coordinator for both programs and the lead faculty member in the mechanical area. He is both a Registered Professional Engineer and a Certified Manufacturing Engineer.

In September 1998 Dr. Ray Bachnak joined A&M-Corpus Christi as the lead faculty member in the Control Systems Engineering Technology area. His background includes BS in electrical engineering and MS and Ph.D. degrees in electrical and computer engineering. He has developed and taught most of the courses in the Control Systems Engineering Technology curriculum. His background includes electrical power, electronics, computer applications such as image and signal processing, and control and digital systems. He has three and one half years of industrial experience and 13 years of teaching experience. He is a Registered Professional Engineer.

Two additional full time faculty members joined the faculty in September 2002. Dr. Hesham Shaalan has a BS degree in electrical engineering, a Master of Electrical Engineering degree with an emphasis in control theory and a Ph.D. in electrical engineering with the major area of electrical power systems and software engineering. His 4 years of industrial experience is in the area of electrical power. He has 7 years of teaching experience and the ability to teach most many of the courses in the Control systems Engineering technology curriculum.

Dr. Satyajit Verma rounds out the full time faculty by bringing a vast knowledge of the process industry. He joined the faculty in September 2002 from his position as a Senior Process Development Engineer with the Celanese Corporation. He has a Bachelor of Technology degree in chemical engineering, MS and Ph.D. degrees in chemical engineering. He has 22 years of industrial experience where he received Five patents for his work with polymers. He brings strength to the Mechanical Engineering Technology program in the materials and thermal sciences area. His knowledge of the process industry also brings strength to the Control Systems Engineering Technology program.

The use of adjunct professors brings a wealth of current, practical knowledge to the classroom. The Engineering Technology program has been fortunate to have many high quality individuals to call upon.

One of the mainstays of the Mechanical Engineering Technology program is Dr. Karl Schuler. He retired from his position as Distinguished Member of the Technical Staff at Sandia National Laboratories after 28 years. His areas of expertise range from blacksmithing, to structural dynamics and shock wave physics. He has taught ENTC 1304 Engineering Design Graphics 1, ENTC 2202 & 2204 Manufacturing Process 1&2, and ENTC 3310 & 3312 Material Science 1&2. He is able to teach all courses in the Mechanical Engineering Technology curriculum. He donates many hours of his time to assist in laboratory development by developing equipment specifications and building laboratory equipment.

Mr. Larry White, a Process Engineer with DuPont Corporation, has BS and MS degrees in chemical engineering and a MS degree in civil engineering. He brings more than 30 years of
industrial experience to the development and teaching of ENTC 3320 Thermodynamics and ENTC 4320 Heat Transfer. He acts as a consultant for the development of our process benches that will be used in our fluid mechanics and control systems classes. He is a Registered Professional Engineer.

Mr. Nandu Dalvi is a Staff Project/Mechanical Engineer with Valero Refining company. He has 35 years of industrial experience. His education includes BS and MS degrees in mechanical engineering. He is a Registered Professional Engineer and is teaching ENTC 4315 Project Management and Justification for the first time.

Mr. Harish Shah is currently a Wastewater Engineer with the City of Corpus Christi. He has BS and MS degrees in civil engineering. He is also currently working on a MS degree in Environmental Engineering. His 18 years work experience includes the design and testing of concrete structures. He has 11 years of teaching experience as an adjunct professor teaching mathematics for Del Mar College. He is a Registered Professional Engineer and is developing and teaching ENTC 4349 Reinforced Concrete Construction for the first time.

The above were the teaching faculty for the Engineering Technology program during the spring semester of 2003. As an example of the quality and breadth of this faculty consider that the 8-person faculty bring a total of 141 years of industrial experience, 75 years of teaching experience, 22 degrees into the classroom. Five of the eight are Registered Professional engineers and 2 others have applications pending.

c. Faculty Student Interaction

The Engineering Technology faculty works hard at encouraging interaction with the students. There are very few business hours where a student can not reach a faculty member for assistance or advising. Faculty members post office hours but do not limit student interaction to those times. Most of the Engineering Technology courses are taught in an integrated lecture/laboratory format. This gives ample opportunity for informal discussions between faculty and students on a wide range of issues during class time.

The Engineering Technology Unit sponsors a student organization, the Engineering Technology Society. This organization sponsors social and well as technical meetings. The faculty is very supportive of these activities.

A formal two tiered advising process is described below.

**Academic Advising Procedure**

**New Student Process:**
If undeclared, the student is seen by the Academic Advising office located on the 2nd floor of the Student Services Building. They are given general information regarding core curriculum requirements and academic programs. Once a student has declared a major, they are then directed to contact the college which houses their program of interest and schedule an appointment with an academic advisor for their discipline.

**Once A Major Is Elected:**
Once a declared ET major has made an appointment the academic advisor will generally review the student’s transcript and prepare a degree plan based on his completed courses and preferred emphasis. During the meeting they review the plan together and discuss course sequences as well as prerequisites and when courses are generally offered to help the student plan his/her schedule.

**During The Appointment:**
During their appointment the student is also introduced to the CAMS dual-expert advising model. It is explained to the student that they are assigned both a faculty mentor at the program level and an academic advisor at the college level to track their progress and also offer various avenues of assistance. At this time, a mentor is assigned and the student is supplied with the
mentor’s contact information and encouraged to visit with that faculty member at least once a semester. Students are further encouraged (but not required) to visit with their academic advisor once a semester as well.

Students are encouraged to keep contact information current on SAIL, so that the University or any University official will be able to contact them. They are also informed about the upcoming group mentoring sessions that showcase student success issues such as how to write a resume, or apply for scholarships. They are made aware that these sessions are considered mandatory and are offered at various times to make it convenient for them to attend.

Miscellaneous:
The academic advisor periodically sends out e-mails reminding students of important deadlines, upcoming mentoring sessions or other relevant information. In order to save time and effort, students are encouraged to e-mail any questions they have prior to scheduling an appointment.

Transfer Students – initial contact:
Transfer students generally come to the University in myriad ways. Some will contact their program of interest first; others come through the college advising office. Still others contact the Office of Admissions & Records transfer counselors. The transfer counselors at the Office of Admissions & Records are an excellent starting point for prospective transfer students who want to know which previous credit hours can be applied at TAMUCC. Genevie Guavara is assigned to work with students who are interested in attending the College of Science & Technology and to determine credit hours transfer in terms of core curriculum. With courses that are program specific and do not meet any core requirements, the program coordinator is the determining entity. In the initial meeting, the academic advisor can certainly review a student’s past work and make forecasts of what might be applicable but will not apply transfer credits to a student’s degree plan until:

1. The office of admissions and records has received official transcripts and accepted the courses and/or
2. The program coordinator has reviewed course descriptions or syllabi (furnished by the student) and make a determination about possible substitutions.

Enrolled transfer students who have declared their majors are treated the same as continuing students described above.

d. Industrial experience by faculty member

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Company</th>
<th>Years Experience</th>
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<tbody>
<tr>
<td>Coppinger</td>
<td>Automation Engineer, IBM, Industrial Systems Division, 9/90-12/90</td>
<td>0.33</td>
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<tr>
<td></td>
<td>Visiting Engineer, Southwest Research Institute, 6/90-8/90</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Field Engineer, City of College Station, 7/80-8/80</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Plan Checker, City of College Station, 7/79-8/79</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Project Engineer, Instrumentation &amp; Special Devices Group, Hughes Tool Co. Oil Tool Division, 1965-1968</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Numerous consulting positions</td>
<td>1.4</td>
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</table>

Table 5 Faculty Industrial Experience
### Table 5 Faculty Industrial Experience (Continued)

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<thead>
<tr>
<th>Faculty</th>
<th>Company</th>
<th>Years Experience</th>
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</thead>
<tbody>
<tr>
<td>Bachnak</td>
<td>Total 3.25 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faculty Fellow, Johnson Space Center, Houston, Texas, 5/02-8/02</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Faculty Fellow, Naval Air Warfare Center, Patuxent River, Maryland, 5/01-7/01</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Faculty Fellow, Naval Air Warfare Center, Patuxent River, Maryland, 5/00-7/00</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Reliability Engineer, Koch Petroleum Group, Corpus Christi, Texas, 6/99-8/99</td>
<td>0.25</td>
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<tr>
<td></td>
<td>Faculty Fellow, Johnson Space Center, Houston, Texas, 6/98-8/98</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Faculty Fellow, Johnson Space Center, Houston, TX, 5/96-8/96</td>
<td>0.25</td>
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<tr>
<td></td>
<td>Project Engineer, Alpha Engineering, Lebanon, Senior 8/94-12/94</td>
<td>0.41</td>
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<tr>
<td></td>
<td>Electrician, Akb Electric, Lebanon, 6/78-8/79.</td>
<td>1.25</td>
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<tr>
<td>Shaalan</td>
<td>Total 3 years</td>
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<tr>
<td>Verma</td>
<td>Total 12 years</td>
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</tr>
<tr>
<td></td>
<td>Sr. Process Engineer, Celanese Corp., Bishop, TX, 1989-2002</td>
<td>3</td>
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<tr>
<td></td>
<td>Staff Chemical Engineer, Barer &amp; Johnson, Baton Rouge, LA, 1980-1982</td>
<td>2</td>
</tr>
<tr>
<td>Schuler</td>
<td>Total 28 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Senior Member of the Technical Staff, Sandia National Laboratories</td>
<td>28</td>
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<tr>
<td>White</td>
<td>Total 30 years</td>
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<tr>
<td></td>
<td>Process Engineer, DuPont Corporation, Corpus Christi, TX, Wilmington, DE, Montague, MI, Memphis, TN</td>
<td>30</td>
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<tr>
<td>Dalvi</td>
<td>Total 34 years</td>
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<tr>
<td></td>
<td>Project/Mechanical Engineer, Valero Refining Company, Corpus Christi, Texas; Petroleum refinery; April 1989 to Present</td>
<td>13</td>
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<tr>
<td></td>
<td>Senior Plant/Project, Lion Oil Company, El Dorado, Arkansas; Petroleum refinery; January 1986 to April 1989</td>
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<td></td>
<td>Operations Manager, Naren Chemicals Private Limited, Bombay, India; January 1979 to September 1985</td>
<td>6.75</td>
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<tr>
<td></td>
<td>Senior Engineer, Shell Oil/Chemical Company, Deer Park, Texas, August 1968 to October 1978</td>
<td>10.16</td>
</tr>
<tr>
<td>Shah</td>
<td>Total of 19 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wastewater Engineer, City of Corpus Christi, Texas December 1995 to Present:</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Vice President, Associated Testing Laboratories of Corpus Christi, Inc. Corpus Christi, Texas, March 1995 to Dec. 1995:</td>
<td>.83</td>
</tr>
<tr>
<td></td>
<td>Project Engineer, Maverick Engineering, Corpus Christi, Texas, September 1989 to March 1995</td>
<td>5.4</td>
</tr>
<tr>
<td></td>
<td>Project Engineer, Moreno &amp; Associates, April 1985 to September 1989</td>
<td>4.4</td>
</tr>
</tbody>
</table>
e. Professional Development

Professional development involves the identification of the need by the faculty, a request to the Computer and Mathematical Sciences chair, followed by prioritizing by the chair and dean and approval based upon available funds.

Professional development typically occurs in conjunction with conference attendance, industry sponsored training, professional society workshops, or locally provided training. For example in December 2002 Dr. Bachnak attended a Field Bus workshop at Lee College in the Houston, Texas area. Funds were also made available to bring Dr. Jerry Vinson to the TAMUCC campus to teach a two day workshop on the advanced features of the Autodesk software. It was attended and Drs. Coppinger, Verma, and Schuller and has resulted in bring these concepts into several different courses.

The following is a list of professional development actives by the full time faculty for the past two years:

Bachnak
- “Foundation Fieldbus Educators Workshop,” Lee College, Texas, 12/16/02-12/20/02.
- “TC2K Program Evaluator Training Workshop,” ABET/IEEE, Montreal, 6/16/02.
- “WebCT Effective Practices Workshop,” Presented by Collegis, 10/2/02 and 10/30/02, CCH 262.
- Attended “Effective Teaching Strategies in Large Classrooms,” A&M-CC, 8/23/02.
- “How to Write a Good University Faculty Research Enhancement Grant,” Presented by Orser and former members of the REC, UC 106B, 10/14/02.
- Diversity and Sexual Harassment Prevention Workshop,” A&M-CC, 4/17/01.
- “Distributed Learning @ the Island Online,” A&M-CC, 12/3/01.
- “WebCT Workshop” on 10/3/01, David Kendrick, TLC, A&M-CC
- “Distributed Learning,” CCH 262, A&M-CC, 1/19/01
- “LabVIEW Hands-On Seminar,” 4/12/01, National Instruments, Holiday Inn, 1102 S. Shoreline, Corpus Christi, TX
- “Getting to Synergy,” Mr. Sam Ramirez, A&M-CC, 12/11/01
- Participated in the “Online Searches for Funding Opportunities Workshop,” Mr. Russell Peek, MOLIS, UC 323, A&M-CC, 3/7/01
- Participated in a workshop on “Furthering Communication Skills of Upper-Division Students,” Dr. Christopher M. Anson, North Carolina State University, UC 223, A&M-CC, 2/19/2001
- Attended the “HSI Grant and Funding Opportunities Summit,” Lewis Hall, TAMUK, 1/30/01

Coppinger
- “How to Handle Difficult People”, workshop, 5/6/02
- “Public Information”, workshop, 8/14/02
- “Introductory FAMIS Training”, 9/11/02
- “Post Award Video Conference”, 9/24
- “Procurement Card Training”, 10/2/02
- “Embedded Assessment Workshop”, Texas Christian Workshop, 10/23/02
- “Advisor’s Update Training”, 10/30/02
- “ABET Evaluator Training”, Washington, D.C, 11/15/02-11/17/02
- “WebCT Update”, 12/4/01
- “WebCT Workshop” 8/6/01, TLC, A&M-CC
- “Presenter training for the Texas Scholars Program”, Corpus Christi Chamber of Commerce, 11/27
- “Four Roles of Leadership”, 11/30/01, 12/7/01, 12/14/01
f. Faculty Credentials

Only one adjunct professor, Mr. Honeycutt, did not have the required minimum credentials. He taught ENTC 2305 Engineering Design Graphics 2 lecture/lab class in the fall of 2001. This course is somewhat unique. It covers many areas of graphics used in the petrochemical and refining industries that are not taught elsewhere in the country. Mr. Honeycutt's background includes being owner of an engineering design firm that installed and set up CAD/CAM systems throughout South Texas. This was at a time before college courses in CAD existed. He was on the forefront of the use of computer aided design (CAD) equipment. Since that time he has extended his skills into other areas of computer graphics such as structural, piping, process and instrumentation. With more than 30 years of project experience using graphics in the designs for the process industry he has more than extended his range of knowledge in the field. He has a BS degree in mechanical engineering and is a Registered Professional Engineer in the State of Texas.

All other faculty meet or exceed the minimum ABET faculty requirements.

g. Faculty Workload Summary, Table 6

<table>
<thead>
<tr>
<th>Table 6 Faculty Work Load Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
</tr>
<tr>
<td>Credit Hours</td>
</tr>
<tr>
<td>Contact Hours Per Week</td>
</tr>
<tr>
<td>Laboratory Size</td>
</tr>
<tr>
<td>Class Size</td>
</tr>
<tr>
<td>Advisees</td>
</tr>
</tbody>
</table>

Teaching load is calculated based on 1 hour of credit for each hour of lecture credit and 2/3 hours of credit for each laboratory credit hour. A full time teaching assignment is considered to be 12 load hours. A course with 3 hours of lecture and 3 hours of laboratory would count as 5 teaching load hours.

h. Additional Materials Available

Official university transcripts for each faculty member is available through the Office of the Provost. Other material will be supplied upon request.

4. Facilities

a. Description

In August 2001 the Engineering Technology program moved into the new 57,000 Science and Technology Building. Engineering Technology had considerable input into the building design.

The building house 14,354 square feet of classroom/laboratory space and 1,303 square feet of office space for the Engineering Technology program. This space serves 33 courses 21 of which have a laboratory component and is distributed as follows:
### Area

<table>
<thead>
<tr>
<th>Room</th>
<th>Use</th>
<th>Area (sq. ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Control Systems Laboratory</td>
<td>754</td>
</tr>
<tr>
<td>114</td>
<td>Manufacturing Process Laboratory</td>
<td>5164 Includes 124 sq. ft. storage</td>
</tr>
<tr>
<td>114 A</td>
<td>Repair Laboratory</td>
<td>253</td>
</tr>
<tr>
<td>115</td>
<td>Capstone Projects Laboratory</td>
<td>1570</td>
</tr>
<tr>
<td>116</td>
<td>Metrology Laboratory</td>
<td>723</td>
</tr>
<tr>
<td>118</td>
<td>Material Science Laboratory</td>
<td>1506</td>
</tr>
<tr>
<td>214</td>
<td>Design Laboratory</td>
<td>1234</td>
</tr>
<tr>
<td>217</td>
<td>Electronics Prototype Laboratory</td>
<td>618</td>
</tr>
<tr>
<td>217 A</td>
<td>Storage</td>
<td>211</td>
</tr>
<tr>
<td>220</td>
<td>Advanced Electronics Laboratory</td>
<td>1345 Includes 49 sq. ft. storage</td>
</tr>
<tr>
<td>221</td>
<td>Basic Electronics Laboratory</td>
<td>976</td>
</tr>
<tr>
<td></td>
<td><strong>Total Laboratory Space</strong></td>
<td><strong>14354</strong></td>
</tr>
<tr>
<td>222</td>
<td>Engineering Technology Offices</td>
<td>1303</td>
</tr>
<tr>
<td></td>
<td><strong>Total Program Space</strong></td>
<td><strong>15657</strong></td>
</tr>
</tbody>
</table>

The Engineering Technology facilities can be considered state of the art.

Laboratories that support common functions are located in close proximity to each other. For example, the large Manufacturing Process laboratory is adjacent to the Control Systems, Material Science, Metrology, and Capstone Projects laboratories.

In an effort to emphasize the applied nature of Engineering Technology even non-laboratory courses are taught utilizing the existing laboratory spaces. Where possible the concept of integrating the lecture and laboratory portions of a course is practiced.

Considerable effort has been paid to the infrastructures. All laboratories have an ample number of computer network connections. The building is wired for CAT 5E compatibility. Spare fiber optic lines are available in the telecommunication closets on each floor. Provisions have been made for rapid changes in room configuration and for student communication projects with the inclusion of exposed overhead cable trays.

There is ample electrical power in each laboratory. Surface mounted power panels connected to emergency power off buttons facilitate the addition of new circuits in each laboratory. An overhead buss duct in the manufacturing process laboratory allows for flexible in equipment placement.

### Adequacy of the Facilities

The Engineering Technology program has been constantly acquiring equipment since the building opened in August 2001. The equipment is considered to be adequate for the number of students currently enrolled. As the program grows more equipment will be acquired. The following is an equipment list by laboratory.

#### Room ST 111 Control Systems Laboratory

Eight Data acquisition systems

Each system consists of several components, including a data acquisition board (NI PCI-MIO-16E-4), a 32-channel analog input module (NI SCXI-1102C), a 6-channel analog output module (NI SCXI-1124), mounting terminal block (NI SCXI-1325), isothermal terminal block (NI SCXI-1303), and a 4-slot chassis (NI SCXI-1000). The National Instruments (NI) Software Solutions Department license, which consists of LabVIEW 6.1 (Laboratory Virtual Instrument Engineering
Workbench), control and simulation toolkit, Internet, Gmath, and signal processing suites, is available for programming these units.


One Level/flow process control trainer

One Process control workshop
This system, by Feedback, offers real-time control via MATLAB and SIMULINK (37-001 Process Control Workshop using MATLAB). The process is represented by a heating element controlled by a thyristor circuit that feeds heat into the airstream circulated by an axial fan along a polypropylene tube. A thyristor detector may be placed at one of three points along the tube, sensing the temperature at that point. The volume of airflow is controlled by varying the speed of the fan via a potentiometer.

One Wireless logging system
The wireless logging system, by Fluke, consists of two wireless data loggers (Hydra 900 MHz wireless system 2625A/WL) communicating to a base station consisting of a wireless modem and windows application software (2625A/WL-700). The base station can support up to 20 remote data loggers. The software allows exporting data in real time to Lotus 1, 2, 3, and Excel by using a Dynamic Data Exchange (DDE) link.

Ten PC workstations
Each workstation has a Pentium IV processor, 1.7 GHz, 256 MB RDRAM, 21” Display, two 40 GB hard drives, 1.44 MB 3.5” floppy drive, Ethernet 10/100, 8/4/32X CD-RW & 8X DVD-ROM, zip 250 drive. A networked laser printer is also available in the lab.

Test equipment
Test equipment that supports the laboratory includes thermocouple calibrators (Fluke 714 thermocouple calibrators), digital thermometers (Fluke 51-2 digital thermometer), temperature calibrators (Fluke 724 temperature calibrator), scopemeters (Fluke 123), hand-held meters (Fluke 73), multi-meters (Agilent 34401A), function generators (Agilent 33120A), power supplies (Agilent E3631A), and frequency counters (Agilent 53131A).

Room ST 114 Manufacturing Process Laboratory
CIM Cell Consisting of Amatrol ASRS, 15 foot Conveyor, Mill & Lathe see information below,
Jupiter Robot, Vision System, Saturn Robot with changeable end effectors and Command Station
Scorbot Articulated Arm Robot and controller
7 Microstop Pentium 2s
1 Microstop Pentium 2
1 Dell Pentium 4 OptiPlex GX 400 computers, 1.4 G Hz, 128 MB RDRAM, 19 inch Dell Trinitorn monitors, 20 GB Hard Drives, 250 MB Zip Drives, SAMSUNG CDRW/DVD-ROM Combo Drives(SM 308B)
Hydraulics Bench Cussons P6100 and accessories
CNC Lathe EMCO PC TURN 55
CNC Mill EMCO MILL 55
CNC Mill Lightmachines
12” Engine Lathe ENCO 111-3310
Milling Machine ENCO 100-1599
Drill Press ENCO 126-2170
<table>
<thead>
<tr>
<th>Equipment</th>
<th>Brand/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grinder Westward</td>
<td>4TM71</td>
</tr>
<tr>
<td>MIG Welder Millermatic 210</td>
<td></td>
</tr>
<tr>
<td>TIG Welder Miller Syncrowave 180SD</td>
<td></td>
</tr>
<tr>
<td>Oxy-Acetylene Welder Uniweld</td>
<td></td>
</tr>
<tr>
<td>Welding Helmets</td>
<td>4 ea. Fibermetal Tiger Hood 990HPU</td>
</tr>
<tr>
<td></td>
<td>2 ea. Jackson EQC</td>
</tr>
<tr>
<td>Iron Worker Scotchman 4014CM</td>
<td></td>
</tr>
<tr>
<td>Shear Grizzly 52-16</td>
<td></td>
</tr>
<tr>
<td>48” Box Break ENCO 130-4816</td>
<td></td>
</tr>
<tr>
<td>Vertical Band Saw</td>
<td>Metal Mizer 2018</td>
</tr>
<tr>
<td>Vise Wilton 1765 Tradesman</td>
<td></td>
</tr>
</tbody>
</table>

**Room ST 115 Capstone Projects Laboratory**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Brand/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Saw</td>
<td>Delta 36-955</td>
</tr>
<tr>
<td>14” Band Saw</td>
<td>Grizzly G1019</td>
</tr>
<tr>
<td>6” Belt/10” Disk Sander</td>
<td>Grizzly G1276</td>
</tr>
<tr>
<td>1” Belt Sander</td>
<td>Grizzly G1013</td>
</tr>
<tr>
<td>Jointer</td>
<td>Grizzly 1182HW</td>
</tr>
<tr>
<td>Air compressor</td>
<td>Speedair 5F237G</td>
</tr>
<tr>
<td>Shop Vacuum</td>
<td>Shop Vac QPL</td>
</tr>
<tr>
<td>Dust Collector</td>
<td>Grizzly G8027</td>
</tr>
</tbody>
</table>

**Room ST 116 Metrology Laboratory**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Brand/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 K Testing Machine w/Computer &amp; Printer</td>
<td>MTI 30K</td>
</tr>
<tr>
<td>Signal Conditioner</td>
<td>MTI BAF-4-2K</td>
</tr>
<tr>
<td>Extensometer</td>
<td>Epsilon 3542-0200-025-ST</td>
</tr>
<tr>
<td>¾ Pt. Bend Fixture</td>
<td>MTI</td>
</tr>
<tr>
<td>Wedge Grips</td>
<td>Curtis “Sure Grip” 15K</td>
</tr>
<tr>
<td>Balance</td>
<td>Mettler Toledo B2002-S</td>
</tr>
<tr>
<td>Height Gages</td>
<td>Grizzly 9620</td>
</tr>
<tr>
<td>Surface Plate/Angle Block</td>
<td>Grizzly/ENCO</td>
</tr>
<tr>
<td>Bore Scope</td>
<td>Olympus IPLEX</td>
</tr>
<tr>
<td>Measurements Trainger</td>
<td>Festo</td>
</tr>
</tbody>
</table>

1 Dell Pentium 4 OptiPlex GX 400 computers, 1.4 G Hz, 128 MB RDRAM, 19 inch Dell Trinitorn monitors, 20 GB Hard Drives, 250 MB Zip Drives, SAMSUNG CDRW/DVD-ROM Combo Drives(SM 308B)

**Room ST 118 Material Science Laboratory**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Brand/Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Treating Furnace</td>
<td>L &amp; L Special Furnaces Co. – GS1714</td>
</tr>
<tr>
<td>Oven for Composite Curing</td>
<td>Precision Economy Oven – 25EG</td>
</tr>
<tr>
<td>Small Heat Treat Furnace</td>
<td></td>
</tr>
<tr>
<td>Metallographic Microscope</td>
<td>Carl Zeiss – 476721</td>
</tr>
<tr>
<td>4 Grit Grinding Table</td>
<td>Leco – DS20</td>
</tr>
<tr>
<td>8” Polishing Wheel</td>
<td>Buehler Meta Serve 2000</td>
</tr>
<tr>
<td>Hardness Tester</td>
<td>Wilson ACCO</td>
</tr>
<tr>
<td>Vacuum Forming</td>
<td>Therm-O-Vac</td>
</tr>
<tr>
<td>Injection Molder</td>
<td>Crystal Alloy Injectors 66M</td>
</tr>
<tr>
<td>Blow Molder</td>
<td>Blowtron 99</td>
</tr>
<tr>
<td>Joining Tester</td>
<td>M200 Beckett Pump</td>
</tr>
<tr>
<td>Ultrasonic Thickness Gage</td>
<td>Krautkramer Branson DME</td>
</tr>
<tr>
<td>Fume Hood</td>
<td>Fisher Hamilton 158C</td>
</tr>
</tbody>
</table>

**Room ST 214 Design Laboratory**

25 Dell Pentium 4 OptiPlex GX 400 computers, 1.3 G Hz, 256 MB RDRAM, 19 inch Dell Trinitorn monitors, 40 GB Hard Drives, 250 MB Zip Drives, 8x CD-RW/DVD-ROM Combo Drives, Video cards
HP 4550N Color Laser Printer

Software that is available includes the latest version of the Autodesk educational product lint that includes AutoCAD 2004, Mechanical Desktop 6, Architectural Desktop 3.3, Inventor 6, The Microsoft Office Suite, Microsoft Project 2002, RISA-3D v4.5

Room ST 217 Electronics Prototype Laboratory
4 Dell Pentium 4 OptiPlex GX 400 computers, 1.4 G Hz, 256 MB RDRAM, 19 inch Dell Trinitorn monitors, 20 GB Hard Drives, 250 MB Zip Drives, SAMSUNG CDRW/DVD-ROM Combo Drives (SM 308B)
1 dell Optiplex GX 240
1 Microstop Computer Pentium 2
HP Laser Jet 4Si
Agilent 1672G Logic Analyzer
Agilent 34401A multimeter
Agilent 33120A function generators
Agilent E3631A power supply
Agilent 53131A frequency counter

Room ST 220 Advanced Electronics Laboratory
1 Dell Pentium 4 OptiPlex GX 260 computers, 2.26 G Hz, 1024 MB DDR SDRAM, 19 inch Dell Ultra Sharp monitor, 40 GB Hard Drives, 250 MB Zip Drives, 8x CD-RW/DVD-ROM Combo Drives
2 Dell Pentium 4 Dell Pentium 4 OptiPlex GX 400 computers, 1.4 G Hz, 128 MB RDRAM, 19 inch Dell Trinitorn monitors, 20 GB Hard Drives, 250 MB Zip Drives, SAMSUNG CDRW/DVD-ROM Combo Drives (SM 308B)

Room ST 221 Basic Electronics Laboratory
There are 12 workstations; each one includes the following:
Digital Multimeter: Agilent 34401A
Function/Waveform generator: Agilent 33120A
Universal counter: Agilent 53131A
Oscilloscope: Agilent 54622A
Personal Computers: 10 Dell Optiplex GX260 with the following specifications: 2.26 GHz
Pentium 4, 512 K Cache, 1.0 GB 266 MHz DDR, 80 GB hard drive
Software: Electronics Workbench (10 copies of Multisim 2001 Education version)
Analog multimeters: 2 Simpson 260 – Series 8, 2 Elenco M-1150
Additional supplies are also available including general electronic components such as transistors and digital components such as logic gates. There are also several breadboards, wire cutters, screwdrivers, and 22 AWG wires.
1 HP Laser Jet 4200n

Software Availability
The following software is available for student use during laboratory time and on a need basis at other times.
Table 7  Software Availability

<table>
<thead>
<tr>
<th>Software</th>
<th>Room 214 Design Lab</th>
<th>Room 221 Basic Electronics</th>
<th>Room 111 Advanced Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrobat Reader</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Auto CAD 2002</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Autodesk 3D Studio VIZ R3i</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Autodesk Inventor 4</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Autodesk Architectural Desktop 3.3</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Autodesk CAD Overlay 2002</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Borland Turbo C++4.5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Distillation Expert-Trainer</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Fathom</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GhostScript</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Internet Explorer</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Java jdk-1.4</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Java jre-1.4</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Java WebSvcPk</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Lightscape</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mathematica(40 copies)</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>MATLAB 6.5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mechanical Desktop 6</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>MS Office 97 (Word, Excel, PowerPoint)</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Microsoft Project</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multisim 2001</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Netscape</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Norton Antivirus</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>National Instruments LabVIEW 6.1</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>National Instruments HiQ R</td>
<td>X</td>
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<tr>
<td>National Instruments CVI</td>
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<tr>
<td>NetOp School</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roxio Easy CD Creator 5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SSH for Windows</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Symantec Antivirus</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>PartSpec 6.5</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volo View Express</td>
<td>X</td>
<td>X</td>
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<tr>
<td>WinZIP</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>WS-FTP</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Students Access**

Students needing access to the Engineering Technology laboratories at hours other than normal class times may contact their professor for authorization. Electronic card access to the
Engineering Technology laboratories using the student’s university identification card is often granted for special projects or when additional laboratory time for the students is needed.

c. Reference Materials

Today catalogs and data books are becoming increasingly obsolete. All student workstations are connected to the university network that gives them access to high speed Internet connection. Students regularly use the Internet for class and laboratory assignments. In many cases the instructor uses examples on industrial web sites rather than the examples in the textbooks. Students use the computers and the computer network on a daily basis. They use the Internet as needed to accomplish their assignments.

Section VIII of the ASME boiler and Pressure Vessel Code, ISA Standards Library are available for student use in the Design Laboratory. Various data books are available for use in the Electronics Laboratories.

d. Additional Materials

The program evaluators will have complete access to all of the Engineering Technology laboratories.

5. Institutional and External Support

a. Institutional Support

Administrative support for the Engineering Technology program begins with the University President, Dr. Robert Furgason. Dr. Furgason, a chemical engineer, was instrumental in working with community leaders to establish the program at Texas A&M-Corpus Christi.

Within the context of a growing university with many diverse calls upon its limited resources the Engineering Technology program has been exceptionally well supported by the University administration. No other program has had a major building designed to support the program’s function. The University has continued to allow small class size (less than 10) to be taught while the program continues to grow. Courses needed for students’ graduation have been taught to as few as one or two individuals. To the credit of the administration no student to date has had to delay graduation because due to a lack of timely course offering.

The Office of Institutional Advancement has been instrumental in acquiring a $1,000,000 endowment from the Rogelio Benavides family for a Memorial Chair in Engineering Technology. This Chair became fully funded in January 2003. A function of this Chair is to emphasize industrial safety.

A second major gift was obtained from the Judy Wright family that gave $1,000,000 to the University. The University’s general scholarship fund was endowed with $500,000 and $500,000 was to be used to purchase equipment for the Engineering Technology program primarily in the control systems area.

Additional funds (approximately $157,000) have been made available to the Engineering Technology program for the purchase of equipment that resulted from the surplus funds set aside for the construction of the Science and Technology building.

These funds in conjunction with grants obtained by the faculty have been adequate to keep pace with the growing student enrollment.

Equipment purchases from gifts, grants, and local funds are initiated by the faculty and approved by the administration. The other source of funds is the Higher Education Assistance Funds (HEAF). HEAF funds are given to the University as a lump sum. The University administration them uses these funds for various purposes. Each year the College of Science and Technology
receives a portion of these funds for the purchase of equipment. The Engineering Technology unit and all other units of the College submit an equipment request. These requests are evaluated and prioritized by the College administration. Only the highest priority items are funded due to difference in available funds and equipment requests.

**Equipment Maintenance**
The first line of equipment maintenance responsibility falls on the Engineering Technology faculty. The faculty is expected to diagnose and repair the equipment as their expertise permit. The CAMS Laboratory Supervisor supplies the next level of maintenance. This individual is responsible for the operation and maintenance of the computer hardware and software used in the laboratories and by the faculty. Backing up the Laboratory Supervisor is the University’s Computer Services personnel. The University has its own repair personnel that in some cases are able to perform factory-authorized service.

The TAMUCC Physical Plant personnel also serve as a resource when a problem is within their expertise. As the last resort the equipment will be repaired by a factory representative either on site or by shipping the equipment back to the factory. Funds for this repair would typically come from the HEAF.

University’s Physical Plant personnel are responsible for the daily operation and maintenance of the facilities. They are also responsible for building repair and maintenance. Additional funding must be sought for any modification or renovation.

The faculty primarily determines the sufficiency of resources. The Engineering Technology Steering Committee determines the direction of the program and advisory committees determine the details. It is the responsibility of the faculty member to establish a prioritized list of needs for each laboratory. The faculty will then establish an overall priority for the program and work to insure acquisition of the needed resources.

Currently the level of support personnel is adequate. The CAMS Laboratory Supervisor, University Computer Service personnel and Physical Plant personnel currently support the Engineering Technology program. As the program grows in size and the equipment continues to grow in complexity it will be necessary to add a technician for specialized repair, maintenance, and installation of mechanical and electronic equipment.

**Faculty Selection and Supervision**
The procedure for faculty recruitment and selection is listed in the College of Science and Technology Faculty Handbook. In general the CAMS Chair appoints 3-5 members of a search committee with the approval of the Dean. In the case of Engineering Technology an industrial member of the Engineering Technology Steering Committee was added as an ex officio member to the search committee. The search committee submits its recommendations to the CAMS Chair. The Dean, after consultation with the Chair, extends a formal verbal offer. The provost then sends a formal contract to the applicant.

The program coordinator and department chair conduct supervision of the faculty as described in the Departmental Policy. This policy provides for a formal annual review process.

The Engineering Technology faculty is housed in the same office suite insuring day to day coordination of activities and supervision.
b. Table 8. Support Expenditures For The Program

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Two years ago</th>
<th>Last Year</th>
<th>Current Year to date</th>
<th>Budgeted for this year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Salary</td>
<td>$157,207.02</td>
<td>$170,555.02</td>
<td>$112,245.68</td>
<td></td>
</tr>
<tr>
<td>Supplies</td>
<td>$1,274.12</td>
<td>$1,386.63</td>
<td>$718.59</td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>$5,009.06</td>
<td>$1,272.58</td>
<td>$1,179.50</td>
<td></td>
</tr>
<tr>
<td>Equipment, Institutional Funds</td>
<td>$138,790</td>
<td>$140,827.05</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Equipment, Grants and Gifts</td>
<td>$183,415.00</td>
<td>$130,697.88</td>
<td>$147,653.47</td>
<td></td>
</tr>
<tr>
<td>Part-time Assistance</td>
<td>$30,768.20</td>
<td>$34,335.76</td>
<td>$7,703.96</td>
<td></td>
</tr>
</tbody>
</table>

6. Assessment

a. Objectives

Note: For the self-study documentation purposes, the term “Goal” is used for the overall Engineering Technology program goals and “Objectives” for the more focused individual programs (MET and CSET) objectives. Therefore, in the following, we elaborate upon the alignment between Engineering Technology Goals and The University Mission.

**University Mission**

Texas A&M University-Corpus Christi is devoted to discovering, communicating, and applying knowledge in a complex and changing world. The university identifies, attracts, and graduates students of high potential, especially those from groups who have been historically under-represented in Texas higher education. Through a commitment to excellence in teaching, research, and service, Texas A&M University-Corpus Christi prepares students for lifelong learning and for responsible participation in the global community.

**University Goals**

By 2010, Texas A&M University-Corpus Christi will establish:

1. A student body, of more than 10,000 students, which is representative of the demographics of the State of Texas and a corresponding increase of faculty and staff to support the students.
2. A faculty dedicated to the continuous improvement of teaching, learning, scholarly research, and creative activity.
3. A statewide reputation for an exemplary undergraduate education, anchored by an integrated core curriculum and learning communities.
4. Recognized master's degree programs that enable students to be leaders in their fields and/or to continue their education at the doctoral level.
5. Strong doctoral programs which include degrees in a discipline related to the Harte Research Institute for Gulf of Mexico Studies, education, computer science, and clinical psychology, bringing the Institution to the doctoral intensive institution classification.
6. An enhanced research focusing on the Gulf of Mexico, early childhood, geographic information systems, and reading education.
7. Collaborations with independent school districts, social agencies, public broadcasting, businesses, community colleges, medical schools, and other entities to provide access to lifelong learning and technological resources so that Texas A&M University-Corpus Christi is considered to be a leader in establishing successful partnerships, particularly to benefit the community.

8. An intellectual and cultural climate that inspires South Texans through the South Texas Institute for the Arts, the Performing Arts Center, and other cultural programs.

9. Programs for students, faculty, and staff to develop leadership, collegiality, and university involvement.

10. Access to the array of information resources and technology infrastructure necessary to support university programs, services, and research.

University Principles
Texas A&M University-Corpus Christi is committed to the realization of its vision, the accomplishment of its mission, and the attainment of its goals by:

- Recruiting, retaining, and supporting a diverse, highly qualified student body, faculty and staff
- Establishing a culture of professionalism and responsibility.
- Fostering free and open intellectual inquiry, accomplishment, and expression.
- Ensuring respectful, fair, and equitable treatment of all individuals.
- Fostering an open, shared, and participatory decision making process.
- Promoting efficient and effective use of time, resources, and technology.
- Providing an active campus life that extends teaching and learning beyond the classroom.
- Providing a safe and secure campus environment for students, faculty, and staff.
- Involving the university community, alumni, civic and government leaders, and other friends of the university in the Texas A&M University-Corpus Christi vision and mission.

The Engineering Technology program facilitates the University's mission of keeping the industry engaged at three levels. An Steering committee consisting of representatives from area industries participates in guiding the overall direction of the program. At the next level, a group of subject matter experts from area industries participate in periodic evaluation of the contents of the various courses offered in the Engineering Technology program and develop new courses that would be relevant to the current state of the industry. At the third level, the industry is involved in providing the department periodic feedback on how the program graduates has been performing as employees and responsible members of the professional community. The details of the various elements of these activities are provided elsewhere in the self-study.

Engineering Technology Mission or Goal
The goal of the Engineering Technology Program is to prepare well-educated, highly skilled, and socially and professionally responsible engineering technologist from a diverse population of students so that they can have productive and rewarding careers at local, state and national levels. To ensure that our graduates are valued by the industry and to continually improve our program, we seek input from employers, our alumni and an industry advisory board so that we meet the changing needs of the industry. The goals of the Engineering Technology program will remain aligned to the goals of the University.

CSET Program Objective
The objective of the Control Systems Engineering Technology Program is to educate the students to be practical and qualified engineering technologists. The program is committed to preparing graduates for productive and rewarding careers in design, marketing, operation and maintenance in the field of instrumentation, measurement, control, robotics, and automation. Graduates will be socially and professionally responsible and possess skills for life-long learning.

MET Program Objective
The objective of the Mechanical Engineering Technology Program is to educate the students to be practical and qualified engineering technologists. The Program is focused at preparing
graduates for productive and rewarding careers in design, installation, manufacturing, testing, technical sales or maintenance of mechanical systems that require an understanding of materials, processes and machine elements. Graduates will be socially and professionally responsible and possess skills for life-long learning

The Engineering Technology mission can be seen to be a subset of the University mission. The alignment can be seen along the following four important dimensions:

1. Serving a diverse population including historically underrepresented groups,
2. Producing skilled graduates who are valued members of the global community,
3. Having a program committed to continual improvement and
4. Collaborating with industry and employers.

Our department actively participates in all University activities related to community outreach and student recruitment efforts, specially those that are directed to historically under-represented groups in Texas Education system. The faculty participates in University sponsored Island Days and Career Fairs. Periodically, the members of the faculty make presentations to the area high schools and middle schools. They also create / co-ordinate program that would attract students to science and engineering programs (e.g. Dr. Bachnak’s summer 2003 program). Student enrollment demographics in the Engineering Technology Program closely resembles the overall University enrollment demographics.

b. Continuing Improvement Plan

The Program

Two levels of advisory committees assist the continuous improvement of the program. A Steering Committee that consists of CEO’s, Presidents, Vice Presidents and Plant Managers meets annually or more often as the need arises to review the overall performance of the program, assure its relevance to the needs of industry, set long range directions, assist in the development of financial and other resources, and make suggestions for the improvement of the program. Much of this review is conducted by electronic means.

Statistics provided by the Office of Planning and Institutional Effectiveness is used to compare program performance to other programs within the university. Any program area that differs significantly from the norm will be addressed.

A survey of the new graduates (Alumni Survey) and their employers (Employer Survey) is conducted 6 months after graduation. All graduates will be surveyed every 2 years. The results of this survey are used to improve the program.

Course and Course Sequences

Ad hoc committees of subject matter experts determine course content and other short-term assignments. A faculty committee reviews each course at the end of the semester in which it is taught. Modifications to the course syllabus and other corrections will be made. A committee of subject matter experts reviews the courses every third year.

Near the completion of each course a college wide student questionnaire is administered. Feedback from these questionnaires is used to improve course content, method of instruction, and the performance of the instructor.

Within each course, examination questions or assignments target the each of course objectives. At the end of the semester each instructor quantifies the class’ performance on each objective. Students also complete a self-evaluation form that targets their opinion of their knowledge of each course objective.
Faculty Member

Quality faculty is the most important feature to a quality education. The characteristics that are of primary importance are competence, currency, and effectiveness. The students and recent graduates, peers, employers, administrators and self-evaluation determine competence and currency of the faculty.

Students are surveyed at the end of each course (Instructor and Course Evaluation Form) and with an exit survey (Exit Questionnaire) that is to be given just prior to graduation. The faculty to continuously improve the curriculum and courses uses the results of these instruments.
Figure 3  Continuous Improvement Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>Area Affected</th>
<th>Duties</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering Committee</td>
<td>Program objectives, overall direction</td>
<td>Consult and advise the faculty and administration on long term program direction, identify opportunities, work for the betterment of the program</td>
<td>Meetings, electronic communications</td>
</tr>
<tr>
<td>Advisory Committees</td>
<td>Groups of related courses, course content</td>
<td>Consult with faculty on establishing the course content appropriate to their areas of expertise</td>
<td>Meetings, electronic Communications</td>
</tr>
<tr>
<td>Faculty</td>
<td>Program objectives, curriculum, course content, graduate employment</td>
<td>Work with the Steering Committee, establish Advisory Committees as needed, modify curriculum and course content as directed, advise students and graduates</td>
<td>Meetings, course evaluation, personal</td>
</tr>
<tr>
<td>Students</td>
<td>Course content, instructional methods, faculty effectiveness</td>
<td>Advise faculty on effectiveness, instructional methods, faculties</td>
<td>Surveys</td>
</tr>
<tr>
<td>Graduates</td>
<td>Program objectives, curriculum, course content</td>
<td>Supply feedback to the program</td>
<td>Surveys, personal faculty contact</td>
</tr>
<tr>
<td>Employers</td>
<td>Program objectives, curriculum, course content</td>
<td>Employ graduates, supply feedback</td>
<td>Survey</td>
</tr>
</tbody>
</table>

Engineering Technology Program

Control Systems Engineering Technology Program Objectives

Mechanical Engineering Technology Program Objectives

ET Curriculum

ET Faculty

ET Students

ET Graduates

Advisory Committees

Employers
c. Evidence that the plan is being implemented

Historically courses have been improved incrementally by the faculty. A knowledgeable and caring faculty has always noted the weak or rough spots in their courses and tried to do better each semester. Much of this course improvement has never been documented. Today more and more attention is being placed upon the program and course objectives. Currently students provide feedback on their perception of the course objectives being met. Based on these results and the instructor’s personal knowledge the instructor prepares recommendations on course improvement that is presented to the Engineering Technology faculty to insure compatibility with other courses and the curriculum. Modified course syllabi documenting these changes will be available for review.

d. Graduates are readily accepted into the workforce and are prepared for continuing education.

Graduates of the Engineering Technology Program

The first graduation of Texas A&M- Corpus Christi Engineering Technology students occurred in May 2002. There were three more in August 2002. An additional 5 graduated in May 2003.

<table>
<thead>
<tr>
<th>Graduate</th>
<th>Graduation Date</th>
<th>Employer or University</th>
<th>Job Title</th>
<th>Reported Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korinne Resendez (CSET)</td>
<td>May 2002</td>
<td>Texas A&amp;M-Corpus Christi (COSC)/ Titan Painting</td>
<td>Graduate Student/ CEO</td>
<td>$110,000</td>
</tr>
<tr>
<td>Allen Woodward (MCET)</td>
<td>May 2002</td>
<td>Repcon Constructors/ Texas A&amp;M-Corpus Christi (MBA)</td>
<td>Planner / Estimator, Graduate Student</td>
<td>$49,000</td>
</tr>
<tr>
<td>James Buntrock (MCET)</td>
<td>August 2002</td>
<td>Orion Construction</td>
<td>Field Office Engineer</td>
<td>$52,000</td>
</tr>
<tr>
<td>Lordes Funtanilla (CSET)</td>
<td>August 2002</td>
<td>Texas A&amp;M-Corpus Christi (GIS)</td>
<td>Graduate Student</td>
<td></td>
</tr>
<tr>
<td>Laura O’Keefe</td>
<td>August 2002</td>
<td>Plans to go to the University of Texas Law School August 2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee Nelson</td>
<td>May 2003</td>
<td>Texas A&amp;M-Corpus Christi (COSC)</td>
<td>Post Baccalaureate Student</td>
<td></td>
</tr>
<tr>
<td>Melissa Newman-Gillespe</td>
<td>May 2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael Oelschelegal</td>
<td>May 2003</td>
<td>Equistar Chemicals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kevin Sayce</td>
<td>May 2003</td>
<td>Northeastern University</td>
<td>Post Baccalaureate Student (Engineering)</td>
<td></td>
</tr>
<tr>
<td>Adam Smith</td>
<td>May 2003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Program Objectives

Well Educated

The program objectives call for the graduates to be well educated and possess the skills for life long learning. Of the 10 graduates of the program 60% are Honors Graduates of the University and 3 are currently pursuing graduate degrees and 2 more are planning post baccalaureate studies.
Highly Skilled
Students are called upon to demonstrate their skill level to the faculty in the individual courses on a routine basis. Once they graduated they demonstrate their skill level to their employers. Employer feedback is used as an indicator of the overall skill level of the Engineering Technology graduates.

Rewarding Careers
Four of the five graduates returned the Alumni Survey. All indicated that their major prepared them for their current career. Four of the 5 were satisfied with their career mobility opportunities. The graduate that was not satisfied blamed the sluggish local economy for lack of job opportunities. Two graduates were very satisfied with their current employment one was satisfied and one was disappointed in the lack of job opportunities locally. Salaries reported by the graduates range from $49,000-$110,000 per year.

Meet the Needs of Industry
The two Employer Surveys that have been returned indicate unanimously that their employees have demonstrated the a-k TAC-ABET criteria to their satisfaction.

Student Satisfaction
In April/May 2002 a the Noel-Levitz Student Satisfaction Inventory was administered to a stratified sample of Christi 1,765 A&M-Corpus students. The results in most all of the categories the Engineering Technology Students were more satisfied that the general A&M-CC population and the national sample. The results of the major categories are listed below.

Table 10  Novel-Levitz Satisfaction Survey Selected Results

<table>
<thead>
<tr>
<th>Item</th>
<th>CSET (n=4)</th>
<th>MCET (n=14)</th>
<th>A&amp;M-CC (n=1,185)</th>
<th>National Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Advising</td>
<td>5.38</td>
<td>4.78</td>
<td>5.01</td>
<td>5.11</td>
</tr>
<tr>
<td>Campus Climate</td>
<td>5.49</td>
<td>5.32</td>
<td>5.15</td>
<td>4.9</td>
</tr>
<tr>
<td>Campus Life</td>
<td>5.04</td>
<td>5.15</td>
<td>4.79</td>
<td>4.70</td>
</tr>
<tr>
<td>Campus Support Services</td>
<td>5.56</td>
<td>5.30</td>
<td>5.23</td>
<td>5.06</td>
</tr>
<tr>
<td>Concern for the Individual</td>
<td>5.39</td>
<td>5.14</td>
<td>4.95</td>
<td>4.79</td>
</tr>
<tr>
<td>Instructional Effectiveness</td>
<td>5.64</td>
<td>5.21</td>
<td>5.29</td>
<td>5.09</td>
</tr>
<tr>
<td>Recruitment and Financial Aid</td>
<td>4.90</td>
<td>4.78</td>
<td>4.67</td>
<td>4.82</td>
</tr>
<tr>
<td>Registration Effectiveness</td>
<td>5.68</td>
<td>5.18</td>
<td>5.00</td>
<td>4.82</td>
</tr>
<tr>
<td>Responsiveness to Diverse Populations</td>
<td>5.53</td>
<td>5.58</td>
<td>5.19</td>
<td>4.92</td>
</tr>
<tr>
<td>Safety and Security</td>
<td>4.92</td>
<td>4.65</td>
<td>4.96</td>
<td>4.33</td>
</tr>
<tr>
<td>Service Excellence</td>
<td>5.12</td>
<td>5.19</td>
<td>4.92</td>
<td>4.72</td>
</tr>
<tr>
<td>Student Centeredness</td>
<td>5.73</td>
<td>5.35</td>
<td>5.18</td>
<td>4.92</td>
</tr>
</tbody>
</table>

e. Additional materials available

The complete Noel-Levitz Student Satisfaction Inventory results, Alumni Surveys, Employer Surveys and the Graduating Senior Exit Surveys will be available for review during the accreditation visit.
7. Program Criteria

a. Meets Program Criteria

Program Criteria for Control Systems Engineering Technology

The Control Systems Engineering Technology program meet the program criteria submitted by the Instrumentation, Systems, and Automation Society, ISA, in the following manner (see the course syllabi for additional information in each case):

a. Apply concepts of automatic control, including measurement, feedback and feedforward regulation for the operation of continuous and discrete systems. ENTC 4446 Control Systems 1 and ENTC 4448 Control Systems 2 contributes to meeting this criterion.

b. Design and implement systems utilizing analog and/or digital control devices. ENTC 4446 Control Systems 1, ENTC 4448 Control Systems 2, and ENTC 4350 Capstone Projects contribute to meetings this criterion.

c. Apply the concepts of chemistry, physics, and electricity/electronics to measurement and control systems. CHEM 1333, CHEM 1111, PHYS 2425 University Physics 1, PHYS 2426 University Physics 2, ENTC 2414 Circuit Analysis 1, and ENTC 3415 Circuit Analysis 2 contribute to meeting this criterion.

d. Apply the concepts of digital and microprocessor systems and functionality of system components/devices for the automation of processes. ENTC 3323 Manufacturing Automation, ENTC 4222 Programmable Logic Controllers, and ENTC 4418 Microprocessors and Microcontrollers contribute to meeting this criterion.

e. Apply the concepts of measurements and sensor selection. ENTC 3444 Principles of Measurements contribute to meetings this criterion.

f. Communicate the technical details of control systems using current techniques and graphical standards. ENTC 2305 Engineering Design Graphics 2, ENTC 4446 Control Systems 1, and ENTC 4448 Control Systems 2 contribute to meetings this criterion.

g. Apply the concepts of mechanics, fluid mechanics, and heat transfer to the design of process control systems. ENTC 2403 Statics and Dynamics, ENTC 3406 Fluid Mechanics and Fluid Power, and ENTC 4320 Heat Transfer contribute to meeting this criterion.

h. Understand and utilize programmable logic controllers (PLC), distributed control systems (DCS) and supervisory control systems for control of manufacturing and processing systems. ENTC 4322 Programmable Logic Controllers and ENTC 4448 Control Systems 2 contribute to meeting this criterion.

Mathematics forms the basis for design, synthesis and analysis in the field of instrumentation and control engineering technology. Associate degree graduates must demonstrate the ability to apply algebra, trigonometry, and elementary calculus in the installation, calibration and trouble-shooting of control systems. Baccalaureate graduates must demonstrate proficiency in the utilization of differential and integral calculus and ordinary differential equations in the design, analysis, and performance assessment of control systems. MATH 2312 Precalculus, MATH 2413 Calculus 1, MATH 2414 Calculus 2, MATH 3315 Differential Equations, ENTC 3444 Principles of Measurements, ENTC 4446 Control Systems 1 and ENTC 4448 Control Systems 2 contribute to meeting this criterion.

In the field of instrumentation and control engineering technology, management and technology are often inextricably intertwined. Therefore
a. Associate degree graduates must demonstrate the ability to recognize and apply the fundamental concepts of economics and management to problems in automatic control systems. MGMT 3312 Behavior in Organizations, ENTC Project Management and Justification, and ENTC 4350 Capstone Projects contribute to meeting this criterion.

b. Baccalaureate degree graduates must demonstrate the ability to utilize modern and effective management skills for performing investigation, analysis, and synthesis in the implementation of automatic control systems. ENTC 4315 Project Management and Justification, ENTC 4448 Control Systems 2, and ENTC 4350 Capstone Projects contribute to meeting this criterion.

Program Criteria for Mechanical Engineering Technology
The Mechanical Engineering Technology program meets the American society of Mechanical Engineers, ASME, program criteria in the following manner: See the course syllabi for additional details in each case.

Associate degree programs must demonstrate that graduates can apply the following principles to the specification, installation, fabrication, test, operation, maintenance, sales, maintenance, or documentation of basic mechanical systems:

a. Technical expertise in a minimum of three subject areas chosen from - engineering materials, applied mechanics, applied fluid sciences, applied thermal sciences, and fundamentals of electricity. ENTC 3310 Material Science 1, ENTC 3312 Material Science 2, ENTC 2403 Statics and Dynamics, ENTC 3316 Strength of Materials, ENTC 3406 Fluid Mechanics and Fluid Power, ENTC 3320 Thermodynamics, ENTC 4320 Heat Transfer, ENTC 2414 Circuit Analysis 1, and ENTC 3415 Circuit Analysis 2 contribute to meeting this criterion.

b. Technical expertise in manufacturing processes, mechanical design, and computer-aided engineering graphics with added technical depth in at least one of these areas. ENTC 2202 Manufacturing Process 1, ENTC 2204 Manufacturing Process 2, ENTC 3332 Design of Machine Elements 1, ENTC 4334 Design of Machine Elements 2, ENTC 1304 Engineering Design Graphics 1, and ENTC 2304 Engineering Design Graphics 2 contribute to meeting this criterion.

c. Expertise in applied physics having an emphasis in applied mechanics plus inorganic chemistry, or, if program objectives do not require chemistry, added technical topics in physics appropriate to the program objectives. PHYS 2425 University Physics 1, PHYS 2426 University Physics 2, CHEM 1311 General Chemistry 1, and CHEM 1111 General Chemistry 1 Laboratory contribute to meeting this criterion.

Baccalaureate degree programs must demonstrate that graduates can apply the following concepts to the analysis, development, implementation, or oversight of mechanical systems and processes:

a. Technical expertise in engineering materials, statics, dynamics, strength of materials, fluid power -or fluid mechanics, thermodynamics, and either electrical power or electronics. ENTC 3310 Material Science 1, ENTC 3312 Material Science 2, ENTC 2403 Statics and Dynamics, ENTC 3316 Strength of Materials, ENTC 3406 Fluid Mechanics and Fluid Power, ENTC 3320 Thermodynamics, ENTC 2414 Circuit Analysis 1, and ENTC 3415 Circuit Analysis 2 contribute to meeting this criterion.

b. Technical expertise having added technical depth in a minimum of three subject areas chosen -from: manufacturing processes, mechanical design, computer-aided engineering graphics. ENTC 2202 Manufacturing Process 1, ENTC 2204 Manufacturing Process 2,
ENTC 3332 Design of Machine Elements 1, ENTC 4334 Design of Machine Elements 2, ENTC 1304 Engineering Design Graphics 1, and ENTC 2304 Engineering Design Graphics 2 contribute to meeting this requirement.

c. **Expertise in applied physics having an emphasis in applied mechanics plus inorganic chemistry, or, if program objectives do not require chemistry, added technical topics in physics appropriate to the program objectives.** PHYS 2425 University Physics 1, PHYS 2426 University Physics 2, CHEM 1311 General Chemistry 1, and CHEM 1111 General Chemistry 1 Laboratory contribute to meeting this criterion.

b. **Additional Materials**

Examples of student work, handouts, and textbooks will be available for review.
PART TWO

Institutional Profile

A. Information Relative To The Entire Institution

1. General Information

Texas A&M University-Corpus Christi
6300 Ocean Drive
Corpus Christi, Texas 78412

Chief Executive Officer:
Dr. Robert R. Furgason, President

2. Type of Control:

Texas A&M University is a member of the state supported Texas A&M University System

3. Regional or Institutional Accreditation

Texas A&M University-Corpus Christi is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097: Telephone number 404-679-4501) to award bachelor's, master's, and doctoral degrees. First accredited 1979. Last accreditation review May 2000. The University is accredited on a ten year cycle.

4. Mission*

Texas A&M University-Corpus Christi is devoted to discovering, communicating, and applying knowledge in a complex and changing world. The university identifies, attracts, and graduates students of high potential, especially those from groups who have been historically under-represented in Texas higher education. Through a commitment to excellence in teaching, research, and service, Texas A&M University-Corpus Christi prepares students for lifelong learning and for responsible participation in the global community.

Goals

By 2010, Texas A&M University-Corpus Christi will establish:

1. A student body, of more than 10,000 students, which is representative of the demographics of the State of Texas and a corresponding increase of faculty and staff to support the students.

2. A faculty dedicated to the continuous improvement of teaching, learning, scholarly research, and creative activity.

3. A statewide reputation for an exemplary undergraduate education, anchored by an integrated core curriculum and learning communities.

4. Recognized master's degree programs that enable students to be leaders in their fields and/or to continue their education at the doctoral level.

5. Strong doctoral programs which include degrees in a discipline related to the Harte Research Institute for Gulf of Mexico Studies, education, computer science, and clinical psychology, bringing the Institution to the doctoral intensive institution classification.

6. An enhanced research focusing on the Gulf of Mexico, early childhood, geographic information systems, and reading education.
7. Collaborations with independent school districts, social agencies, public broadcasting, businesses, community colleges, medical schools, and other entities to provide access to lifelong learning and technological resources so that Texas A&M University-Corpus Christi is considered to be a leader in establishing successful partnerships, particularly to benefit the community.

8. An intellectual and cultural climate that inspires South Texans through the South Texas Institute for the Arts, the Performing Arts Center, and other cultural programs.

9. Programs for students, faculty, and staff to develop leadership, collegiality, and university involvement.

10. Access to the array of information resources and technology infrastructure necessary to support university programs, services, and research.

**Principles**

Texas A&M University-Corpus Christi is committed to the realization of its vision, the accomplishment of its mission, and the attainment of its goals by:

- Recruiting, retaining, and supporting a diverse, highly qualified student body, faculty and staff
- Establishing a culture of professionalism and responsibility.
- Fostering free and open intellectual inquiry, accomplishment, and expression.
- Ensuring respectful, fair, and equitable treatment of all individuals.
- Fostering an open, shared, and participatory decision making process.
- Promoting efficient and effective use of time, resources, and technology.
- Providing an active campus life that extends teaching and learning beyond the classroom.
- Providing a safe and secure campus environment for students, faculty, and staff.
- Involving the university community, alumni, civic and government leaders, and other friends of the university in the Texas A&M University-Corpus Christi vision and mission.

**Purpose**

Texas A&M University-Corpus Christi is a comprehensive urban university located on the South Texas Gulf Coast. The University focuses on the higher education needs of South Texas and the state, and on coastal and urban issues, with special emphasis on Allied Health, Applied Technology, Arts and Humanities, Business Administration, Environmental Studies and Teacher Education.

5. **Institutional Support Units**

The University provides a variety of academic support services that complement the academic programs and help students reach their educational goals.

**Office Of New Student Programs**

The Office of New Student Programs coordinates programs that inform first-year students, transfer students, and prospective students about the educational opportunities available on campus. Examples include New Student Orientation, Transfer Student Orientation, Island Days, and Transfer Days. New Student Orientation is designed to provide first-year students with information, placement testing, academic advising, and registration. Advisers assist students in selecting the courses for their first semester at A&M-Corpus Christi. Parents who attend the orientation program have their own activities and have opportunities to meet key faculty and administrative personnel for an exchange of questions and ideas. Transfer Student Orientation provides transfer students with an opportunity to gain information, meet with degree counselors, become familiar with the campus, and register for classes. New Student Orientation programs are offered prior to the fall and spring semesters. Students will be provided with dates upon their acceptance to the University. Campus tours are available throughout the year.
The Office of New Student Programs, which is part of the Office of Admissions and Records, is located in the Student Services Center. For additional information, please call (361) 825-6051 or log on to http://tour.tamucc.edu.

Academic Advising Center
The Academic Advising Center (AAC) serves as the administrative and advising home for students who have earned fewer than 30 semester hours of credit, and for those with 30 to 59 hours of credit who have not officially declared an academic major. Additionally, the AAC is the administrative home for all students who are required to pass the TASP examination and who have not yet done so. Students in the program are assigned faculty advisors who assist them with course selection and other academic matters. A principal feature of the AAC is the extensive, direct involvement of the University faculty, both as advisors and mentors. The AAC is located in Room 214 of the Student Services Center. For more information, please call (361) 825-5931.

Academic Testing Center
The Academic Testing Center (ATC), located in the Student Services Center, administers national, state and local academic tests, including the College-Level Examination Program (CLEP). The Credit by Examination policy for A&M-Corpus Christi is found in the General Academic Policies and Regulations section of the University Catalog.

Information is available at the ATC on the Graduate Record Examination (GRE), required for admission to most graduate schools, and the Graduate Management Admission Test (GMAT), required for most business schools.

The ATC also administers the state-mandated TASP (Texas Academic Skills Program) test in the months of March, April, June, July, August, and November. Students must take the TASP before they enroll in college-level work at A&M-Corpus Christi (see information on TASP requirements in the “Admission” section of the University Catalog).

For more information regarding Academic Testing Center services, please call (361) 825-2334. Also, visit ATC’s web site at www.tamucc.edu/~atcweb.

Tutoring and Learning Center
The Tutoring and Learning Center (TLC) is committed to providing academic support services to help students reach their own educational goals and succeed in the university environment. The programs are designed to improve the retention and graduation rates of university students. Students are encouraged to contact the Tutoring and Learning Center, located in Room 216 of the Bell Library, or call (361) 825-5933 for further information.

TLC Services
The needs of students coming to TLC are thoroughly assessed through tests, individual instructors, and by the TLC Intervention Specialists. The center’s primary service is peer tutoring in mathematics, writing, chemistry, Spanish, history, study skills and most general studies courses.

Services are free and available to all A&M-Corpus Christi students. In order to receive tutoring in a subject, a student must be enrolled in that course at A&M-Corpus Christi. TLC operates on a walk-in basis. Students do not need appointments, but the writing tutors do encourage students to make appointments when requesting assistance. For more information, please call (361) 825-5933 or visit the web site at www.tamucc.edu/~tlcweb.

TLC Microcomputer Lab
TLC’s Microcomputer lab provides academic assistance by utilizing computer software in subject areas such as writing, math, reading, political science and history. Self-help
videotapes are available in a variety of topics such as TASP preparation, note-taking skills, test-taking strategies, time management, dealing with math anxiety, learning styles, managing stress and dealing with test anxiety. For more information, please call (361) 825-5933.

TLC Supplemental Instruction (SI)
TLC also offers Supplemental Instruction (SI) that is designed to increase student performance and retention. This program targets large entry-level courses and provides regularly scheduled, out-of-class, peer facilitated sessions.

Mary and Jeff Bell Library
The Mary and Jeff Bell Library is the University's major resource for research and study. The Library houses a collection of approximately 1.1 million books, bound periodicals, microforms, and government publications and maintains subscriptions to over 2,204 serials and research sets in paper and microform formats. In addition, the Library provides electronic access to thousands of electronic journals, newspapers, and other library resources. Strong media collections and significant collections of South Texas books and archival materials provide unique resources for scholars.

Librarians assist individuals in locating, using, and evaluating information sources that support and enhance class assignments and research. Librarians also instruct classes in the information sources of specific subject areas. All new students receive a tour and orientation to the library as part of their introduction to the campus. Services and resources are reviewed regularly to meet changing curricular demands and to support new and developing academic programs.

The Library is committed to providing an interconnected and productive electronic environment to facilitate the search for information. The Library provides computer access to a multitude of databases containing indexes and abstracts, as well as full-text and full-image versions of many books and articles from periodicals. General Internet access is also available on all workstations.

The Library Instruction Center is an electronic classroom within the library where members of the library staff provide group instruction to help students develop information retrieval skills and strategies. When the room is not reserved for an instruction session, it is a general access computer lab.

The Library Media Center provides access to the library's media collections and playback equipment. Small screening rooms and a multimedia computer lab in the Media Center allow students, faculty and staff to study materials from the collections and to use educational CD-ROM software, video capture equipment, flatbed and slide image scanners, a color laser printer, presentation software, and many specialized software packages not available in the academic computing laboratories.

The Special Collections & Archives Department houses a collection of rare books and archives dealing chiefly with the life, history and culture of Corpus Christi and South Texas as well as other books and manuscripts that require special housing and handling. These materials are available to individual students, university classes, and researchers under special and appropriate conditions within the department.

In order to augment the resources available locally to faculty and students, the Library actively participates in national, state, and regional networks, commercial information services, area library agreements and interlibrary loan arrangements that provide access to materials not available on the Texas A&M University-Corpus Christi campus. Through the statewide TexShare cooperative library program, students and faculty have borrowing privileges at many other academic and public libraries in Texas.
Computing Resources
Texas A&M University-Corpus Christi provides over 300 computer workstations in general purpose computer laboratories for the student body. These computers, which are part of the campus network, are available for student use in the library, Corpus Christi Hall, and several other buildings. Most computer laboratories are open over 85 hours per week, and are staffed with student lab assistants who provide support in various programs. The laboratories are equipped with a wide range of software applications, such as word processors, spreadsheets, graphics programs, programming languages, and specialized software applications that support individual classes. All students, faculty and staff are provided email, file space, dial-in, and internet access. The dormitories are mixed dial-in and local area network. Students are afforded assistance by training classes, computer help sheets, and a help desk. Faculty has access to student records from their offices through the Student Information System (SIS).

In addition to the general-purpose laboratories, curriculum specific laboratories are provided in support of business, education, engineering technology, computer science, nursing, and kinesiology. The Department of Computing and Mathematical Sciences (CAMS) manages several laboratories that are open for students from Monday to Thursday from 07:30 am until midnight, Friday from 07:30 am until 5:00 pm, Saturday from 10:00 am until 6:00 pm, and Sunday from 2:00 pm until midnight. The following paragraphs briefly list the equipment and software packages available in these labs. Detailed information may be found at: http://www.sci.tamucc.edu/wiki/CAMSLab/CAMSLab

CI 226 Computer Lab
22 Dell Pentium 4 Opti Plex 260 computers, 2 G Hz, 1 GB DDR, 80 GB Hard Drives, 250 MB Zip Drives, 32X DVD-CDRW Combo Drives. 2 Dell Pentium 4 Opti Plex GX 240 computers, 1.6 G Hz, 512 MB SDRAM, 40 GB Hard Drives, 250 MB Zip Drives, 8X CD-RW/DVD Drives. 2 Dell Pentium 4 Opti Plex GX 400 computers, 1.3 G Hz, 256 MB RDRAM, 40 GB Hard Drives, 250 MB Zip Drives, 8X CD-RW/DVD-ROM Combo Drives. 1 Microstop Pentium 3 dual processor, two 27 GB Hard Drives, Red Hat Linux only (auk). Dual boot with RedHat 8.0 Linux and Windows 2000 operating systems.

CI 228 Computer Lab
30 Dell Pentium 4 Opti Plex GX 240 computers, 1.6 G Hz, 512 MB SDRAM, 17 inch Viewsonic monitors, 40 GB Hard Drives, 250 MB Zip Drives, 8X CD-RW/DVD Drives. Dual boot with RedHat 8.0 Linux and Windows 2000 operating systems.

CI 229 Computer Lab
22 Dell Pentium 3 Dimension XPS computers, 933 M Hz, 256 MB RDRAM, 19 inch Dell P991 monitors, 45 GB Hard Drives, 250 MB Zip Drives, 8X CD-RW, 48X CD-ROM. Dual boot with RedHat 8.0 Linux and Windows 2000 operating systems.

CI 230 Computer Lab
31 Dell Pentium 4 Opti Plex GX 400 computers, 1.3 G Hz, 256 MB RDRAM, 17 inch Dell M781 monitors, 40 GB Hard Drives, 250 MB Zip Drives, 8X CD-RW/DVD-ROM Combo Drives. Dual boot with RedHat 8.0 Linux and Windows 2000 operating systems.

CI 346 Real-Time Lab
One Silicon Graphics Onyx 3400 supercomputer, four X 400 M Hz, 4 GB Ram, 2X 73 GB Fibre Channel Hard drives, 24 inch Super Wide monitor 5 Microstop Pentium 3 computers, 600 M Hz, 256 MB SDRAM, 17 inch Viewsonic monitors, 27 GB Hard Drives, 250 MB Zip Drives, 4X CD-RW 1 1996 Dell computer for special projects 3 DTK Red Hat Linux computers for parallel processing. Dual boot with RedHat 8.0 Linux and Windows 2000 operating systems.
ST 208 Computer Network Lab
6 (5 operational) Intergraph dual processor, Pentium 3, dual boot with RedHat 8.0 Linux and Windows 2000 operating systems for networking instruction. 73 mixed old computers used for Beowulf parallel processing clusters.

The engineering technology courses are supported by dedicated laboratories equipped with computers and software packages as follows:

ST 111 Controls Lab

ST 214 Design Lab

ST 221 Basic Electronics Lab

CAREER SERVICES
The Career Services helps students explore, select, prepare for, and actively pursue satisfying employment and careers. Career planning is a process which should begin early in the first year at college. Students should avail themselves of the following career services:

- Career counseling, vocational assessment and computerized assisted guidance, which help students explore career options beginning in their first semester. Students may meet with a Career Counselor to explore interests and values, with a view toward choosing a career. For students who are experiencing difficulty choosing a major, this can be a useful process of self-exploration.
- Job search and graduate school advisement
- Student employment services: assistance in finding on- or off-campus employment
- Internship and co-op placement assistance for students at all levels
- On-line job listings via Career Services website (http://career.tamucc.edu)
- Job listing
- On-campus recruiting
- Job fairs throughout the year targeted at different majors
- Electronic résumé referral service
- Career Resource Library and Lab
- Career seminars and workshops
- Videotaped “mock” interviews with trained counselors and professionals.

Career Services is located on the third floor of the University Center. For information, call (361) 825-2628 or visit the web site at http://career.tamucc.edu/.
B. The Engineering Technology Unit

1. Organization

The academic programs at Texas A&M University-Corpus Christi fall into one of four colleges, the College of Science and Technology, the College of Education, the College of Business, and the College of Arts and Humanities.

The College of Science and Technology is the largest of the four colleges and is administratively divided into departments of Computer and Mathematical Sciences (CAMS), Physical and Life Sciences (PALS), and the School of Nursing and Health Sciences.

Engineering Technology is one of four units within the CAMS department. The other programs are Computer Science, Mathematics, and Geographic Information Science. Engineering Technology offers two related degree programs.

The Engineering Technology faculty teaches all courses with Engineering Technology designations (ENTC). The supporting courses in mathematics (MATH), physics (PHYS), chemistry (CHEM), management (MGMT), and the University Core Curriculum are taught by the faculty in their respective departments.

Figure 4, Organizational Chart illustrates the administrative structure. Dr. Sandra Harper is the Provost and Vice President of Academic Affairs. Dr. Diana Marinez is the Dean of the College of Science and Technology. Dr. Carl Steidley is the head of the Computer and Mathematical Sciences (CAMS) department and Dr. J. Tim Coppinger is the Coordinator of the Engineering Technology Unit. Within the Engineering Technology Unit Dr. Ray Bachnak assists with the coordination of the Control Systems Engineering Technology program.

Engineering Technology Mission or Goal
The goal of the Engineering Technology Program is to prepare well-educated, highly skilled, and socially and professionally responsible engineering technologist from a diverse population of students so that they can have productive and rewarding careers at local, state and national levels. To ensure that our graduates are valued by the industry and to continually improve our program, we seek input from employers, our alumni and an industry advisory board so that we meet the changing needs of the industry. The goals of the Engineering Technology program will remain aligned to the goals of the University.

CSET Program Objective
The objective of the Control Systems Engineering Technology Program is to educate the students to be practical and qualified engineering technologists. The program is committed to preparing graduates for productive and rewarding careers in design, marketing, operation and maintenance in the field of instrumentation, measurement, control, robotics, and automation. Graduates will be socially and professionally responsible and possess skills for life-long learning.

MET Program Objective
The objective of the Mechanical Engineering Technology Program is to educate the students to be practical and qualified engineering technologists. The Program is focused at preparing graduates for productive and rewarding careers in design, installation, manufacturing, testing, technical sales or maintenance of mechanical systems that require an understanding of materials, processes and machine elements. Graduates will be socially and professionally responsible and possess skills for life-long learning.
Dr. Sandra Harper
Provost
And Vice President for
Academic Affairs

Dr. Diana Marinez, Dean
College of Science
and Technology

Dr. Grady Price-Blount
Chair,
Physical and Life
Sciences

Dr. Carl Steidley
Chair,
Computing and
Mathematical Sciences

Dr. Mary Jane Hamalton
Chair,
Nursing and Health
Sciences

Dr. Gary Jeffress, RPLS
Coordinator
Geographic Information
Science

Dr. Peter Kuntu-
Mensah
Dr. Joseph Loon
Mr. Stacey Lyle

Dr. Carl Steidley
Acting Coordinator
Computer Science

Ms. Carol Binkerd
Ms. Charlotte Busch
Ms. Nancy Cameron
Dr. Stephen Dannely
Mr. Stephen Fant
Dr. Mario Garcia
Dr. Dulal Kar
Mr. Kent Kerr
Dr. Patrick Michaud
Dr. Michelle Moore
Dr. James Nystrom
Dr. Holly Patterson-
McNeill
Dr. David Thomas

Dr. Mufid Abudiab
Dr. Caryn Bellomo
Dr. Nadina Duran
Dr. Jose Giraldo
Dr. Michael Hardy
Dr. Karen Heinz
Dr. Edward Jones
Dr. Moon Kim
Dr. Alex Sadovski
Dr. Blair Sterba-
Boatwright

Dr. Tim Coppinger, PE
Coordinator
Engineering Technology

Dr. Ray Bachnak
Dr. Hesham Shaalan
Dr. Satyajit Verma

Figure 4   Organizational Chart
2. Programs Offered and Degrees Granted

A&M-Corpus Christi offers Bachelor of Science degrees in Control Systems Engineering Technology and in Mechanical Engineering Technology. Both programs are being submitted for their initial accreditation review. The programs are taught primarily during normal business hours with some classes offered in the evening hours. Both full time students and part time students take the same classes taught by the same instructors. Dr. J. Tim Coppinger, Engineering Technology Coordinator, is the person in charge of the program.

Table 11 Programs Offered

<table>
<thead>
<tr>
<th>Name of Program</th>
<th>Day</th>
<th>Full Time</th>
<th>Degree Conferred</th>
<th>Name and Title of Person in Charge</th>
<th>Submitted for Evaluation Not Now Accredited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Systems Engineering Technology</td>
<td>X</td>
<td>X</td>
<td>BS</td>
<td>Dr. J. Tim Coppinger</td>
<td>X</td>
</tr>
<tr>
<td>Mechanical Engineering Technology</td>
<td>X</td>
<td>X</td>
<td>BS</td>
<td>Dr. J. Tim Coppinger</td>
<td>X</td>
</tr>
</tbody>
</table>

3. Administrator

Dr. J. Tim Coppinger serves as the administrative head of the Engineering Technology unit. A summary vitae follows.

**J. TIM COPPINGER**
Professor, Engineering Technology Coordinator
Texas A&M University-Corpus Christi

**EDUCATION:**
B.S., Mechanical Engineering, Texas A&M University, 1965
M.S., Mechanical Engineering, Texas A&M University, 1967
D.E.D., Environmental Design, Texas A&M University, 1975

**ACADEMIC EXPERIENCE:** 35 Years
Texas A&M University-Corpus Christi, 6 years, 1997-present
Engineering Technology Coordinator,
Texas A&M University, 29 years, 1968-1997
Engineering Technology Department, 1985-1997
Coordinator of the Mechanical Engineering Technology Program, 1985-1987
Engineering Design Graphics Department 1968-1985
Professor, 1980-1997
Appointed to the Graduate Faculty, 1976
Associate Professor, 1975-1980
Assistant Professor, 1968-1975

**INDUSTRIAL EXPERIENCE:** 5 Years
Automation Engineer, IBM, Industrial Systems Division, 9/90-12/90
Visiting Engineer, Southwest Research Institute, 6/90-8/90
Field Engineer, City of College Station, 7/80-8/80
Plan Checker, City of College Station, 7/79-8/79
Project Engineer, Instrumentation & Special Devices Group, Hughes Tool Co. Oil Tool Division, 1965-1968
Numerous consulting positions

**PROFESSIONAL LICENSES:**
Registered Professional Engineer, TX No. 29499, 1969
Certified Manufacturing Engineer, Robotics No. 1922326, 1989
Licensed Peace Officer, Master Peace Officer Certificate, Texas Commission on Law Enforcement Officer Standards and Education, 1995
Master Electrician, Cities of Pearland, Friendswood and Alvin, Texas, 1970

**SCIENTIFIC AND PROFESSIONAL SOCIETIES:**
American Society of Engineering Education, 1968-present
American Society of Mechanical Engineers, 1985-present
ISA-The International Society for Measurements and Controls, 1996-date
Society of Manufacturing Engineers, 1985-date,
SME Robotics Institute of America, 1986-date
SME Computer and Automated Systems Assoc., 1986-date

**RECENT HONORS, AWARDS, PUBLICATIONS**
"Why CIM?", Coppinger and Steidley, ASEE Annual Conference, Albuquerque, June 25, 2001

4. Supporting Academic Departments

Engineering Technology students are required to take courses from the following departments or programs: Mathematics (MATH), Chemistry (CHEM), Physics (PHYS), Computer Science (COSC), Management (MGMT), English (ENGL), History (HIST), Political Science (POLI), Communications (COMM), Philosophy (PHIL), Economics (ECON), Social Science of either Psychology (PSYC), Sociology (SOCI), and Fine Arts of either Art (ARTS), Music (MUSI), Theater (THEA).
To insure that the A&M-Corpus Christi students receive an integrated educational experience many of the courses are coordinated through the University Core Curriculum Program. Contact for each programs or department is listed in Table 12.

Table 12  Contacts for Supporting Academic Departments

<table>
<thead>
<tr>
<th>PROGRAM</th>
<th>NAME</th>
<th>TITLE</th>
<th>EMAIL</th>
<th>PHONE Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH</td>
<td>Dr. George Tintera</td>
<td>Program Coordinator</td>
<td><a href="mailto:tintera@falcon.tamucc.edu">tintera@falcon.tamucc.edu</a></td>
<td>6028</td>
</tr>
<tr>
<td>CHEM</td>
<td>Dr. Mark Morvant</td>
<td>Program Coordinator</td>
<td><a href="mailto:mmorvant@falcon.tamucc.edu">mmorvant@falcon.tamucc.edu</a></td>
<td>6023</td>
</tr>
<tr>
<td>PHYSICS</td>
<td>Dr. Mirley Balasubramanya</td>
<td>Program Coordinator</td>
<td><a href="mailto:bala@falcon.tamucc.edu">bala@falcon.tamucc.edu</a></td>
<td>6020</td>
</tr>
<tr>
<td>COSC</td>
<td>Charlotte Busch</td>
<td>Interim Coordinator</td>
<td><a href="mailto:cbush@falcon.tamucc.edu">cbush@falcon.tamucc.edu</a></td>
<td>2448</td>
</tr>
<tr>
<td>ECON</td>
<td>Dr. Robert Vokurka</td>
<td>Chair</td>
<td><a href="mailto:Vokurka@cob.tamucc.edu">Vokurka@cob.tamucc.edu</a></td>
<td>2458</td>
</tr>
<tr>
<td>MGMT</td>
<td>Dr. Leon Dube</td>
<td>Chair</td>
<td><a href="mailto:ldube@cob.tamucc.edu">ldube@cob.tamucc.edu</a></td>
<td>2482</td>
</tr>
<tr>
<td>CORE CURRICULUM</td>
<td>Sonya Witherspoon</td>
<td>Program Coordinator</td>
<td><a href="mailto:Sonya.Witherspoon@mail.tamucc.edu">Sonya.Witherspoon@mail.tamucc.edu</a></td>
<td>2585</td>
</tr>
<tr>
<td>ENGL</td>
<td>Dr. Elizabeth Mermann-Jozwiak</td>
<td>Chair, Department of English</td>
<td><a href="mailto:Elisabeth.Mermann-Jozwiak@mail.tamucc.edu">Elisabeth.Mermann-Jozwiak@mail.tamucc.edu</a></td>
<td>5990</td>
</tr>
<tr>
<td>HIST</td>
<td>Dr. Javier Villarreal</td>
<td>Chair, Department of Humanities</td>
<td><a href="mailto:Javier.Villarreal@mail.tamucc.edu">Javier.Villarreal@mail.tamucc.edu</a></td>
<td>2316</td>
</tr>
<tr>
<td>POLS</td>
<td>Dr. David Billeaux</td>
<td>Chair, Department of Social Sciences</td>
<td><a href="mailto:David.Billeaux@mail.tamucc.edu">David.Billeaux@mail.tamucc.edu</a></td>
<td>2393</td>
</tr>
<tr>
<td>COMM</td>
<td>Dr. Kelly Quintanilla</td>
<td>Chair, Communications &amp; Theatre</td>
<td><a href="mailto:Kelly.Quintanilla@mail.tamucc.edu">Kelly.Quintanilla@mail.tamucc.edu</a></td>
<td>5991</td>
</tr>
<tr>
<td>PSYC</td>
<td>Dr. Steve Seidel</td>
<td>Chair, Department of Psychology</td>
<td><a href="mailto:Steve.Seidel@mail.tamucc.edu">Steve.Seidel@mail.tamucc.edu</a></td>
<td>2619</td>
</tr>
<tr>
<td>SOC</td>
<td>Dr. David Billeaux</td>
<td>Chair, Department of Social Sciences</td>
<td><a href="mailto:David.Billeaux@mail.tamucc.edu">David.Billeaux@mail.tamucc.edu</a></td>
<td>2393</td>
</tr>
<tr>
<td>ARTS</td>
<td>Dr. Carey Rote</td>
<td>Chair, Department of Arts</td>
<td><a href="mailto:Carey.Rote@mail.tamucc.edu">Carey.Rote@mail.tamucc.edu</a></td>
<td>2372</td>
</tr>
<tr>
<td>MUSI</td>
<td>Dr. James Rennier</td>
<td>Chair, Department of Music</td>
<td><a href="mailto:Jim.Rennier@mail.tamucc.edu">Jim.Rennier@mail.tamucc.edu</a></td>
<td>2305</td>
</tr>
<tr>
<td>THEA</td>
<td>Dr. Kelly Quintanilla</td>
<td>Chair, Communications &amp; Theatre</td>
<td><a href="mailto:Kelly.Quintanilla@mail.tamucc.edu">Kelly.Quintanilla@mail.tamucc.edu</a></td>
<td>5991</td>
</tr>
<tr>
<td>PHIL</td>
<td>Dr. Javier Villarreal</td>
<td>Chair, Department of Humanities</td>
<td><a href="mailto:Javier.Villarreal@mail.tamucc.edu">Javier.Villarreal@mail.tamucc.edu</a></td>
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</table>
5. Engineering Technology Finances

Table 8 Support Expenditures for the Program (Repeated)

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Two years ago</th>
<th>Last Year</th>
<th>Current Year to date</th>
<th>Budgeted for this year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Faculty Salary</td>
<td>$157,207.02</td>
<td>$170,555.02</td>
<td>$112,245.68</td>
<td></td>
</tr>
<tr>
<td>Supplies</td>
<td>$1,274.12</td>
<td>$1,386.63</td>
<td>$718.59</td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>$5,009.06</td>
<td>$1,272.58</td>
<td>$1,179.50</td>
<td></td>
</tr>
<tr>
<td>Equipment, Institutional Funds</td>
<td>$138,790</td>
<td>$140,827.05</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>Equipment, Grants and Gifts</td>
<td>$183,415.00</td>
<td>$130,697.88</td>
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<td>$30,768.20</td>
<td>$34,335.76</td>
<td>$7,703.96</td>
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</tr>
</tbody>
</table>

6. Engineering Technology Personnel and Policies


The College of Science and Technology procedure for the selection and evaluation of part-time faculty is as follows:

**Recruitment and Appointment:**
Individuals within the community normally contact the Department/School and the College concerning a desire to teach at the University on a part-time basis. Applications sent to the College or University are forwarded to the Chair/Director at the Department/School level. When a course needs to be offered and no full-time faculty is currently available to teach the course, an adjunct or part-time individual is sought. The starting point in that search is those individuals who have expressed a desire to teach at the University. If a match can be obtained with qualifications and available time of the adjunct/part-time faculty, the individual is usually offered a contract. If a good fit can not be found within the individuals who have expressed interest, then Chair/Director will seek qualified individuals from other sources, which shall include, but not be limited to, referrals from faculty, faculty from other near-by institutions, etc. Prior to a contract being issued, the Chair/Director will discuss the appointment with the Dean. Contract can only be issued through the Dean’s Office.

Qualifications are verified through phone or personal interviews, CVs and transcripts. A personnel file is maintained in the College office. All part-time and adjunct faculty must provide original transcripts of all college and university work and a current CV. Adjunct faculty members must complete all required Human Resource forms. There are no exceptions to this policy.

**Supervision:**
Supervision of individuals who have been hired as part-time/adjunct faculty is the responsibility of the corresponding Chair/Director. The primary component of the evaluation of
these part-time/adjunct faculty members is teaching. The Chair/Director shall seek various inputs to identify the quality of teaching by these individuals. The inputs should include (but are not limited to) student evaluations, class visits, student and peer comments, and other factors that measure teaching performance. Due to the short-term and non-permanent nature of the employment relationship, any problems that arise should be addressed with the part-time/adjunct faculty member as quickly as possible.

**Student Access:**
All part-time/adjunct faculty members shall make themselves available for students at some time other than class hours. These part-time/adjunct faculty members must give the students (usually printed on the syllabus) means to contact the instructor and arrange a meeting to review problems or concerns of the student. Rooms for meetings between the faculty member and the student are provided within the College. Office hours of part-time/adjunct faculty member should be established.

In Engineering Technology the duties of selection and supervision has been delegated to the program Coordinator. The Engineering Technology faculty through local engineering professional societies and personal industrial contacts normally recruits part-time faculty members.

7. The Engineering Technology Enrollment and Degree Data

The Engineering Technology program has grown steadily since it offered its first class of 6 students in January 1998 to 101 students in the fall of 2002, 43 of which are freshmen. The program had its first graduating class of 2 students in the spring of 2002 followed by 3 graduates in August 2002.

**Figure 5 Enrollment Growth**

**Figure 6 Enrollment Distribution**
## Engineering Technology Enrollment and Degree Data

## Table 13  Enrollment by Year

<table>
<thead>
<tr>
<th>Control Systems Engineering Technology</th>
<th>Current</th>
<th>One Year Ago</th>
<th>Five Years Ago</th>
<th>Bachelor Degrees Conferred</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st Year</td>
<td>2nd Year</td>
<td>3rd Year</td>
<td>4th Year</td>
</tr>
<tr>
<td>Control Systems Engineering Technology</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td>6</td>
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<tr>
<td>Mechanical Engineering Technology</td>
<td>30</td>
<td>14</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Total, Engineering Technology Unit</td>
<td>43</td>
<td>20</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Institution Total</td>
<td>1718</td>
<td>1214</td>
<td>1245</td>
<td>1624</td>
</tr>
</tbody>
</table>
8. Definition of Credit Unit

The definition of a credit unit at A&M-Corpus Christi meets or exceeds the Technology Accreditation Commission (TAC) definition of a credit hour. One academic year consists of 30 weeks of classes and one semester credit hour represents one hour of lecture or 2-3 hours of laboratory exclusive of final exams.

9. Admission and Graduation Requirements, Basic Programs

Admission
The Engineering Technology Unit subscribes to the general admission policies for the University and does not have any specific additional requirements for admission at this time.

New Student Process:
If undeclared, the student is seen by the Academic Advising office located on the 2nd floor of the Student Services Building. They are given general information regarding core curriculum requirements and academic programs. Once a student has declared a major, they are then directed to contact the college which houses their program of interest and schedule an appointment with an academic advisor for their discipline.

Once a major is elected:
Once a declared ET major has made an appointment the academic advisor will generally review the student’s transcript and prepare a degree plan based on the completed courses and preferred emphasis. During the meeting they review the plan together and discuss course sequences as well as prerequisites and when courses are generally offered to help the student plan his/her schedule.

During the appointment:
During their appointment the student is also introduced to the CAMS dual-expert advising model. It is explained to the student that they are assigned both a faculty mentor at the program level and an academic advisor at the college level to track their progress and also offer various avenues of assistance. At this time, a mentor is assigned and the student is supplied with their mentor’s contact information and encouraged to visit with that faculty member at least once a semester. Students are further encouraged (but not required) to visit with their academic advisor once a semester as well.

The student is encouraged to keep their contact information current on SAIL, as that is how the University and any University official will be able to contact them. They are also informed of the upcoming group mentoring sessions that showcase student success issues such as how to write a resume, or apply for scholarships. They are made aware that these sessions are considered mandatory and are offered at various times to allow for the student’s convenience in terms of schedule.

Miscellaneous:
The academic advisor periodically sends out e-mails reminding students of important deadlines, upcoming mentoring sessions or other relevant information. Students are encouraged to e-mail any questions they might have which could save them from having to make an appointment or taking time out of their schedules to come by.

Transfer Students – initial contact:
Transfer students generally come to the University in myriad ways. Some will contact their program of interest first; others come through the college advising office. Still others contact the Office of Admissions & Records transfer counselors. The transfer counselors at the Office of Admissions & Records are an excellent starting point for prospective transfer students who want to know what previous work can be applied at TAMUCC. Genevie Guavara is assigned to work...
with students who are interested in attending the College of Science & Technology and she is able to determine what work transfers in terms of core. With courses that are program specific and do not meet any core requirements, the program coordinator is the determining entity. In the initial meeting, the academic advisor can certainly review a student’s past work and make forecasts of what might be applicable but will not apply transfer credits to a student’s degree plan until:

- The office of admissions and records has received official transcripts and accepted the courses and/or
- The program coordinator has had the opportunity to review course descriptions or syllabi (furnished by the student) and make a determination about possible substitutions.

Enrolled transfer students who have declared their majors are treated the same as homegrown students described above.

Admission requirements to the University may be found in the University Catalog or on the web at [https://www.applytexas.org/adappc/general/c_new.wb](https://www.applytexas.org/adappc/general/c_new.wb)

**Graduation**

The requirements and procedure for graduation are listed in the University Catalog. In addition to the general requirements for the University the College of Science and Technology have additional requirements. These requirements are also listed in the University Catalog and include:

- Minimum of 45 upper-division hours
- Minimum of 36 upper-division hours completed at Texas A&M University-Corpus Christi
- Minimum of 2.0 overall grade point average (4 point system) with 2.25 GPA in the courses in the major field of study.

As for graduation clearance process, the student's progress is tracked semester by semester via the college's academic advising office that updates their degree plans (once established). At the culmination of the student's career, the student is invited to meet with their advisor to discuss any unmet University or program requirements. Students are encouraged to apply for graduation one semester prior to their expected graduation term. Student Information System (SIS) is utilized to determine that each student who has applied for graduation is indeed eligible.

Engineering Technology Degree Form Used by the College of Science to verify the students eligibility for graduation. The academic advising office in the College of Science & Tech works closely with the Office of Admissions & Records to resolve any issues. A Graduation Clearance Sheet is prepared by the advisor and signed by the student as an understanding of what must be completed during the final term to ensure graduation. After final grades are posted they are listed on the Student's final degree plan which is then signed and approved by the Dean. These are then forwarded to the Office of Admissions & Records who do the final checks and award the degrees. Examples of the forms used may be found in Appendix 1.

The Engineering Technology Unit has no additional specific requirements for admission or graduation.

**10. Non-academic Support Units**

There are no non-academic Support Units that only support the Engineering Technology academic programs.
## Appendix 1

<table>
<thead>
<tr>
<th>Form</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employer Survey</td>
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<tr>
<td>Alumni Survey</td>
<td>118</td>
</tr>
<tr>
<td>Course Objective Feedback Form</td>
<td>119</td>
</tr>
<tr>
<td>Exit Questionnaire</td>
<td>120</td>
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<tr>
<td>Instructor and Course Evaluation Form</td>
<td>127</td>
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<tr>
<td>College Degree (audit) Plan for CSET</td>
<td>128</td>
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<tr>
<td>College Degree (audit) Plan for MCET</td>
<td>129</td>
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<tr>
<td>College Graduation Clearance Form</td>
<td>130</td>
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<tr>
<td>Records Graduation Clearance form</td>
<td>131</td>
</tr>
<tr>
<td>Engineering Technology Brochure</td>
<td>132-133</td>
</tr>
<tr>
<td>Selected Adjunct Professor Vita</td>
<td>134</td>
</tr>
</tbody>
</table>
Part 1 to be completed by the employee:
I grant my supervisor permission to answer the questions below. The feedback will be used by Texas A&M University-Corpus Christi for statistical purpose and the continuous improvement of the Engineering Technology Program.

Name:              Date:

Part 2 to be completed by the employer:
Does the employee named above demonstrate that they have:

1. An appropriate mastery of the knowledge, techniques, skills and modern tools for their discipline
   □ Yes □ No □ Unknown

2. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering and technology
   □ Yes □ No □ Unknown

3. An ability to conduct, analyze and interpret experiments and apply experimental results to improve processes
   □ Yes □ No □ Unknown

4. An ability to apply creativity in the design of systems, components or processes appropriate to their job function
   □ Yes □ No □ Unknown

5. An ability to function effectively on teams
   □ Yes □ No □ Unknown

6. An ability to identify, analyze and solve technical problems
   □ Yes □ No □ Unknown

7. An ability to communicate effectively
   □ Yes □ No □ Unknown

8. A recognition of the need for, and an ability to engage in lifelong learning
   □ Yes □ No □ Unknown

9. An ability to understand professional, ethical and social responsibilities
   □ Yes □ No □ Unknown

10. A respect for diversity and a knowledge of contemporary professional, societal and global issues
    □ Yes □ No □ Unknown

11. A commitment to quality, timeliness, and continuous improvement
    □ Yes □ No □ Unknown

Comments and suggestions for improving the Engineering Technology Program at Texas A&M University-Corpus Christi?

Name:           ,   Title:
Company:       
Address:       
Phone:         Email:       

Your assistance is greatly appreciated: Please return the survey to coppinger@tamucc.edu or mail and send to:

Dr. J. Tim Coppinger
Engineering Technology Coordinator
Texas A&M University-Corpus Christi
6300 Ocean Drive
Corpus Christi, TX 78412
Dear Graduate

Your response to the questions that follow will enable us to continue to improve our service to you and the others that follow in your footsteps. Your feedback is extremely important and will only be reported as statistical information.

1. Major:
   - Control Systems Engineering Technology
   - Mechanical Engineering Technology

2. Date of Graduation:
   - May, August, December

3. Have you been satisfied with the employment or graduate education opportunities available to you since graduation? □ Very satisfied, □ Satisfied, □ Disappointed, Explain why:

4. What is your job title or graduate school major?

5. If employed, what is your approximate annual salary?

6. What is the name and address of your current employer or university:

7. Briefly describe your job duties:

8. Did your major at A&M-Corpus Christi prepare you for your current career? □ Yes, □ No, Explain why:

9. Are you satisfied with your career mobility opportunities? □ Yes, □ No, Explain why:

10. When did you begin looking for employment or post baccalaureate opportunities: □ The semester before graduation, □ The semester of graduation, □ After graduation

11. What, if any, educational or training opportunities do you intend to pursue in the future?

12. What areas of the Engineering Technology program need to improve?

13. In order to stay in touch would you please supply us with your current address, phone number, and preferred email address?

   Name:
   Address:
   Phone number:
   Email address:

Your assistance is greatly appreciated: Please return the survey to coppinger@tamucc.edu or mail and send to:

Dr. J. Tim Coppinger
Engineering Technology Coordinator
Texas A&M University-Corpus Christi
Intro to the Process Industry

Instructor: ___________________     Date:___________________

As part of our effort to continuously improve our courses and methods of delivery we need your feedback. Please answer the questions below and return the form to the staff member in ST 207 D. Thanks for your help.

Has this course met its objectives? Please use a 5 point rating scale with 5 being absolutely and 1 being not at all.

_____ Define key terms used in process technology.
_____ Describe the roles and responsibilities of process technicians and technologists.
_____ Identify instruments and equipment used in the process industry.
_____ Describe and apply the basic principles of pressure, fluid flow, temperature, and distillation.
_____ Describe the operations and applications of valves, pumps, compressors, steam turbines, and heat exchangers.
_____ Define quality control principles and terms.
_____ Describe air pollution control, solid waste control, toxic substance control, and community right-to-know principle.
_____ Define standards and codes found in a safety program.
_____ Contrast the burning of solids, liquids, and gases.

What was good about this course and should not be changed?

How could this course be improved?
Texas A&M University-Corpus Christi
Engineering Technology

Questionnaire for Seniors Graduating May 2003

This information will be used to develop more effective programs and improve services for students. It will be used only for statistical purposes. No attempt will be made to identify individuals.

1. Number of years enrolled at TAMU-CC
   a. 1 year   d. 4 years
   b. 2 years   e. 5 years
   c. 3 years   f. more than 5 years

2. Approximate GPR at TAMU-CC
   a. Less than 2.0   d. 3.0-3.5
   b. 2.0-5.2   e. 3.5-4.0
   c. 2.5-3.0

3. Age at graduation
   a. 20 years old   d. 26-29 years old
   b. 21-22 years old   e. 30 years or over
   c. 23-25 years old

4. Sex
   a. Male   b. Female

5. What are your plans upon graduation
   a. Secure an industrial position
   b. Enter active military service
   c. Attend graduate school
   d. Undecided

6. If you plan to work in industry, have you started interviewing?
   a. Yes   b. No   c. Plan to attend graduate school, so not interviewing.

7. If yes to #6, how many interviews have you had?
   a. 0   d. 3 or more
   b. 1   e. not interviewing
   c. 2

8. When did you start the interview process?
   a. Less than 1 month ago   d. 3-4 months ago
   b. 1-2 months ago   e. 5-6 months ago

9. Realistic estimate of the annual salary you expect to accept
   a. $32,000 to $36,000   d. $44,000 to $48,000
b. $36,000 to $40,000  

c. $40,000 to $44,000  

e. $48,000+

10. Did you use the Career Center?

a. Yes  
b. No  
c. Not applicable  

11. If yes, the service received was:

a. Very satisfactory  
b. Satisfactory  
c. Somewhat helpful  
d. Not satisfactory  
e. Did not use the Placement Center  

12. Do you intend to go to graduate school?

a. Yes-Full time immediately  
b. Yes-Part time immediately  
c. Some day  
d. No

13. What will be your major if you are planning graduate study?

a. Engineering  
b. Business Administration  
c. Education  
d. Other, Specify ____________________  
e. Not applicable

14. Will you attend graduate school at TAMU-CC if you are planning graduate study?

a. Yes  
b. No  
c. Not applicable

15. Do you plan to enter or re-enter the military service?

a. Yes  
b. No  
c. Not applicable

16. If you had it to do all over again, would you enroll in the same curriculum as the one from which you are now graduating?

a. Yes  
b. Definitely Not  
c. Unsure
17. If the answer to #21 is "definitely not", in what curriculum would you enroll?
   a. Engineering  
   b. Liberal Arts  
   c. Computer Science  
   d. Business  
   e. Other

18. Would you enroll again at TAMU-CC?
   a. Yes  
   b. No

19. Do you own a computer?
   a. Yes, a PC  
   b. Yes, a MacIntosh  
   c. No, because I have good access to computers on campus  
   d. No, because a friend or roommate has one  
   e. No, because I have not used computers in my course work

20. Can you write original software with confidence?
   a. Yes  
   b. No  
   c. Seldom  
   d. No

21. Can you typically operate commercial software after moderate study of the help menu or the documentation?
   a. Yes  
   b. No  
   c. Seldom  
   d. No

22. Check your ability to use word processing software
   a. Business letters and regular reports involving text only  
   b. Plus table and some special symbols  
   c. Plus equations and/or graphics  
   d. Have not or cannot use word processing

23. Check you ability to use PowerPoint software
   a. Create simple slide show using text  
   b. Create slide show using graphics  
   c. Create slide show including importing graphs and charts  
   d. Have not or cannot use PowerPoint
24. In your studies at TAMU-CC, the use of computers was integrated into your class work and/or laboratory exercises.
   a. Extensively into several courses in ENTC and elsewhere
   b. Extensively in several ENTC courses
   c. Moderately in about three courses
   d. Moderately in one or two courses
   e. Not at all

25. On a ten-point scale, assess your overall ability to use computers
   a. 9 to 10 Excellent
   b. 7 to 8 Very Good
   c. 5 to 6 Good
   d. 3 to 4 Fair
   e. 0 to 2 Poor

Concerning the instruction you received at Texas A&M-Corpus Christi, rate its effectiveness to you according to the following scale:
   a. Excellent
   b. Good
   c. Poor
   d. Took elsewhere

26. Mathematics
27. Physics
28. Chemistry
29. Social Sciences & Humanities
30. English
31. Computer Science Courses
32. ENTC Lecture Courses
33. ENTC Laboratory Courses

34. When did you finish your required mathematics?
   a. Sophomore year
   b. First semester junior year
   c. Second semester junior year
   d. First semester senior year
   e. Second semester senior year or later

35. In your upper level ENTC courses
   a. Calculus was used as a normal part of several courses
   b. Calculus was used only occasionally in a few courses
   c. Calculus was almost never used
**FACULTY**

Evaluate only those faculty from whom you actually took one or more courses. The rating scale is:

a. Excellent  

b. Good      
c. Not as effective as other faculty  
d. Did not take a course from this instructor

_____ 36. Coppinger  _____ 42. Pratt  
_____ 37. Bachnak  _____ 43. Ochiai  
_____ 38. Shaalan  _____ 44. Colwell  
_____ 39. Verma  _____ 45. Fox  
_____ 40. Schuler  _____ 46. Calloway  
_____ 41. White  _____ 47. Honeycutt

**COMMENTS**

48. List the three most significant "POSITIVE" factors you considered when evaluating the faculty:

a)  

b)  

c)  

49. List the three most significant "NEGATIVE" factors you considered when evaluating the faculty:

a)  

b)  

c)
50. What did you find were the strongest and weakest features of your program?

51. Where should we work hardest to improve?

52. Comment on the Advising that you received. (general academics, major specific, and personal).

51. Have you accepted employment? ______Yes ______No

53. If yes, where? (name, company address, and job title)
54. Do you have a plan for your personal continuous improvement? If so, describe briefly?

55. Do you have an understanding of your professional and ethical responsibilities?
   a. Yes  
   b. No  
   c. Have not thought about it
Texas A&M University Corpus Christi
Instructor and Course Evaluation
J. Coppleger
College of Science & Technology (CAMS)
ENTC 4360.001
Spring 2002

Completion of the following demographic items is optional

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<th>Overall GPA</th>
<th>College</th>
<th>Current Hours</th>
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<tbody>
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<td>Arts&amp;Humanities</td>
<td>3 or Less</td>
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<td>4 - 6</td>
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<td>11-15</td>
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<tr>
<td>Other</td>
<td>Not Applicable</td>
<td>Undecided</td>
<td>16 or More</td>
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Marking Instructions

- Use a No. 2 pencil or blue or black pen only.
- Erase all marks completely.

Expected Grade

A B C D F Other

Number of Absences

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<tr>
<td>2-4</td>
<td>P-Pass</td>
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<tr>
<td>5-7</td>
<td>D-Disaster</td>
</tr>
<tr>
<td>8+</td>
<td>SD-Super Disaster</td>
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</table>

S A N D SD NA

1. The instructor seemed enthusiastic about the material that was presented.
2. I gained a good understanding of concepts and principles in this field.
3. I believe the instructor was an effective teacher.
4. Grades are assigned fairly and impartially.
5. The instructor seemed well prepared for each class.
6. The instructor treats students with respect.
7. The instructor sets high standards for students.
8. The instructor suggests specific ways students can improve.
9. The instructor's presentations added to my understanding of the material.
10. The instructor is willing to meet and help students outside of class.
11. The instructor is sensitive to student difficulties with course work.
12. On the whole, this is a good instructor.
13. On the whole, this was a good course.
14. The teacher stressed important concepts in the lecture.
15. The instructor communicated ideas and concepts effectively.
16. Assigned reading, problems, papers, etc. helped in mastering course content.
17. Graded work (exams, papers, etc.) contributed to the learning experience.
18. The course objectives were clearly stated.
19. The amount of material covered in this course was appropriate.
20. The textbook assigned was clearly written and compatible with course objectives.
### Texas A&M University-Corpus Christi
BACHELOR OF SCIENCE IN CONTROL SYSTEMS ENGINEERING TECHNOLOGY
TENTATIVE DEGREE PLAN

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**UNIVERSITY CORE CURRICULUM**

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**COMMON ELECTIVES**

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**COMPUTER ACQUISITION**

| FOREIGN LANGUAGE | UCDP 1101 | Ord | Hrs | GP |
|                  | UCDP 1102 |     |     |    |
|                  | TOTAL 0   |     |     |    |

Last Rev ewd/Revised on: 3/22/2003

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**NOTE:**
TEXAS A&M UNIVERSITY-CORPUS CHRISTI
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING TECHNOLOGY
TENTATIVE DEGREE PLAN

Name: 
ID: 
Address: 
City: ZIP: 
Faculty Advisor: 

Emphasis: MECHANICAL ENGINEERING TECHNOLOGY
Coming Year: 2002-2003
Minor: 
Telephone: 
E-Mail: 

UNIVERSITY CORE CURRICULUM

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SPECIFIC MEET COURSES

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**Select one of the following Blocks:**

MAINTENANCE BLOCK

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TOTAL: 0  *UPPER DIV: 0

ELECTIVES

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TOTAL: 0  *UPPER DIV: 0

TOTAL HOURS (MIN 126): 0
UPPER DIVISION HOURS (MIN 45): 0

SIGNATURES

Student: 
Advisor: Date: 
Chair: 
Dean: Date: 

3/22/2003

Last Reviewed/Revised on:
TEXAS A&M UNIVERSITY-CORPUS CHRISTI
COLLEGE OF SCIENCE AND TECHNOLOGY
CANDIDATE FOR GRADUATION
UNDERGRADUATE CLEARANCE SHEET

Name: ____________________________ Anticipated Graduation: ____________________________
ID#: ____________________________ Major: ____________________________
Residency: ________________________ Waiver: ____________________________
Honors: __________________________ Transfer Work: ____________________________
Semester prior to graduation: ________ High School Transcript: ____________________________

GPA: _______ Hours: __________ GPA in Major: __________
Upper-Level Hours: ________________

Coursework Needed:

<table>
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<tr>
<th>GR</th>
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Comments: ____________________________

Student ____________________________ Date ____________________________

Degree Counselor ____________________________ Date ____________________________
Texas A&M University-Corpus Christi
Graduation Checkout - UG Degrees Only
Spring 2003 - Department of Computing & Math Sciences

This analysis assumes successful completion of all current work

Name: 
Stu ID: 
Street: 
City/ST/Zip: 
Phone: 
College: 

Degree: 
Major: 
Catalog: 
Honors: 

Graduation Requirements - UnderGraduate

Foreign Language: 
Computer Literacy: 
Total Hrs Earned: 
TAMUCC Hrs: 
Upper Division Hrs: 
TASP Status: 

Correspondence Hrs: 
Extension Hrs: 
Military Hours: 
Cumulative GPA: 
Residence: 
6 Year Catalog:
Engineering Technology
at TAMU-CC

More information about these requirements, including course descriptions and syllabi, may be found on the engineering technology web site located at http://www.sci.tamu.edu/ent.

Engineering Technology Society (ETS)

ETS is dedicated to furthering the education of its members by providing them with support, leadership, training, and opportunities. In addition, ETS promotes Engineering Technology to gain support for the Engineering Technology programs at Texas A&M University-CC. More information about ETS may be found at http://www.sci.tamu.edu/-ent/ETS.html

Scholarships

A number of scholarships are available to Engineering Technology students. A current list of available scholarships may be found at http://www.sci.tamu.edu/-ent/scholarship.html

For more information on Engineering Technology at TAMU-CC, contact:

Dr. J. Tim Coppinger, Coordinator
Engineering Technology
Centre for Instruction 501
Texas A&M University–Corpus Christi
6500 Ocean Drive
Corpus Christi, TX 78412
(361) 825-5899
coppinger@tamu.edu

B.S. Degree in Control Systems Engineering Technology

B.S. Degree in Mechanical Engineering Technology
Engineering Technology at TAMU-CC

Texas A&M University-Corpus Christi offers two engineering technology degree programs: Control Systems Engineering Technology (CSET) and Mechanical Engineering Technology (MET). The objective of the engineering technology program is to prepare graduates for a variety of career paths. The focus is on the applied aspects of science and engineering and the courses are designed to provide intensive instruction in real world applications. Graduates are provided with a firm foundation in both theory and practice.

The American Society for Engineering Education defines Engineering Technology as "the profession in which a knowledge of the applied mathematical and natural sciences gained by higher education, experience, and practice is used to create and enhance technologies that benefit humanity." Engineering technology education stresses industrial practices and focuses primarily on analyzing, implementing, and improving existing technologies. Graduates from an ABET accredited baccalaureate program may take the Fundamental of Engineering Exam for registration as a Professional Engineer.

Control Systems Engineering Technology

The CSET program prepares students for careers involving the design, programming, installation, operation and maintenance of electronic and mechanical control devices and systems. Courses emphasize topics in electronics, computer applications, measurements, sensors, analyzers, and actuators. Graduates may find employment in various technical areas including instrumentation, automation, manufacturing, process technology, and electric power.

The CSET program follows the guidelines of the International Society for Measurement and Control (ISA) and will be seeking accreditation from the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET).

Mechanical Engineering Technology

The MET program prepares students for careers involving the design, manufacture, installation, operation, and maintenance of mechanical devices and machines. Courses emphasize computer-aided design, materials, fluid mechanics and fluid power, power, and project management. Graduates may find employment in various technical areas including manufacturing operations, fabrication, materials handling, quality assurance, production supervision, and plant operations.

The MET program allows students to choose from technical electives in the maintenance of machinery and facilities or in the area of industrial construction. The MET program will be seeking accreditation from the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET).

Degree Requirements

The requirements for the CSET and MET B.S. degrees are shown in the following table.

<table>
<thead>
<tr>
<th>Category</th>
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1. Note to the University Catalog for details. Engineering Technology students should take MATH 2475, not MATH 1471.
2. Transfer students with 29 or more hours are exempt.

Common Engineering Technology Courses

Pre Calculus
Math 1324
Calculus II
Math 2414
General Chemistry I
Chem 111/111
University Physics I
Phys 2421
University Physics II
Phys 2424
Organizational Structure
Mgmt 3312
Introduction to Process Industries
Engr 2403
Engineering Design Graphics I
Engr 2304
Engineering Design Graphics II
Engr 2305

Specific Control Systems Engineering Technology Courses

Differential Equations
Math 3315
Digital Logic
Engr 2414
Microprocessors/Microcontrollers
Engr 4438
Programmable Logic Controllers
Engr 4525
Manufacturing Automation
Engr 3325
Principles of Measurements
Engr 3444
Control Systems I
Engr 4444
Control Systems II
Engr 4448

Specific Mechanical Engineering Technology Courses

Manufacturing Process I
Engr 2202
Manufacturing Process II
Engr 2204
Material Science I
Engr 3310
Material Science II
Engr 3312
Strength of Materials
Engr 3316
Thermodynamics
Engr 3320
Design of Machine Elements I
Engr 3532
Design of Machine Elements II
Engr 4534

Technical Elective Block

The student may elect to take either block of technical electives, but may not select courses from both blocks. Students with special interests may submit a proposal for an alternate 9-hour block to the Engineering Technology adviser for approval prior to taking any alternate course.

Construction Block
Cost Estimating
Engr 3346
Structural Steel Construction
Engr 4548
Reinforced Concrete Construction
Engr 4549

Maintenance Block
Rotating Equipment
Engr 3355
Total Product Maintenance I
Engr 3356
Total Product Maintenance II
Engr 3358
Adjunct Professors
Summary Vita

KARL W SCHULER
Adjunct Professor, Engineering Technology
Texas A&M University-Corpus Christi

EDUCATION:
BME, Mechanical Engineering, Pratt Institute, 1962
Ph.D., Mechanics, Illinois Institute of Technology, 1967

ACADEMIC EXPERIENCE: 10 Years
Texas A&M University-Corpus Christi, 2000-present
Adjunct Professor, Engineering Technology

University of New Mexico, 1986-1990
Adjunct Professor, Mechanical Engineering

Illinois Institute of Technology, 1965-1966
Teaching Assistant, Mechanics Department

INDUSTRIAL EXPERIENCE: 41 Years
Consultant, Sandia National Laboratories, 1996-present
Consultant, Jupiter Corporation, 1998
Consultant, Onyx Engineering, 1997
Distinguished Member of the Technical Staff, Sandia National Laboratories, 1985-1996
Member of the Technical Staff, Sandia National Laboratories, 1967-1985
Design and Field Engineer Trainee, New York Naval Shipyard, 1957-1962

SCIENTIFIC AND PROFESSIONAL SOCIETIES:
American Society of Mechanical Engineers, 1968-present
Society for Experimental Mechanics
American Geophysical Union

RECENT HONORS, AWARDS, PUBLICATIONS


INSTITUTIONAL AND PROFESSIONAL SERVICE IN THE LAST THREE YEARS

American Society of Mechanical Engineers
Board Member, South Corpus Christi, 1997-2000

RECENT UNIVERSITY ACTIVITIES:

Professional development activities in the last three years

“Emco CNC machine tools”, workshop, 4/02
“Autodesk Update Training”, workshop, 12/02
“WebCT Workshop”, Center for Teaching Excellence, TAMUCC, 10/02
“Scanner Workshop”, Center for Teaching Excellence, TAMUCC, 11/02
“Adobe Photo Shop Workshop,” Center for Teaching Excellence, TAMUCC, 10/02

LARRY L. WHITE

1301 South Bay Dr.                    December 6, 2000
Corpus Christi, Texas, 78414       Married
361-991-5225 (Home)                  Age: 50
361-776-6825 (Work)                Born: May 12, 1950

EDUCATION
3/72    Bachelor of Science in Chemical Engineering from Louisiana Tech University in Ruston, Louisiana.
8/73    Master of Science in Chemical Engineering from Louisiana Tech University in Ruston, Louisiana. Received a Texaco Research Fellowship for my M.S. Degree in Chemical Engineering.
5/76    Master of Science in Civil Engineering from Memphis State University in Memphis, Tennessee.
95 to   Part time graduate student in mathematics at Texas A&M University in Corpus Christi.

MILITARY HISTORY
Member of the Coast Guard Reserve from June, 1968, to June, 1974. Honorable Discharge at the rank of Engineman Second Class.

CERTIFICATION
Registered Professional Engineer in the State of Tennessee.

MISCELLANEOUS
During 1994/1995, I participated in the Corpus Christi Vision 2000 Economic Development Task Force. I also was a member of the Desalination Citizens Advisory Committee during this time.

PROFESSIONAL SOCIETIES
Member of the American Institute of Chemical Engineers.

PROFESSIONAL DEVELOPMENT COURSES & SEMINARS
July, 1998    Quality Systems Auditor Training
             DuPont Quality Management & Technology, DuPont Company
May, 1999    Process Hazard Analysis (PHA)
             DuPont Corporate Safety Standards, DuPont Company
July, 2001    Validation Master Planning (FDA validation)
March, 2001  Institute for International Research, Inc.
DuPont Project Team Leader Academy
DuPont Engineering University, DuPont Company

April, 2001  Preventing Human Error
American Institute of Chemical Engineers

June, 2001  Facility Siting Course (DKL-145-9)
Process Safety Institute, a Division of EQE International, Inc.

June, 2002  Pressure Relief System Design Seminar
DuPont Engineering, DuPont Company

WORK HISTORY
1989 to Present
Title & Location: Engineering Associate; DuPont, Corpus Christi, Tx
I provided the technical support for the “SUVA” HFC-134a Processes at the DuPont Corpus Christi Plant. This involved following the construction and start up of these Processes. After start up I monitored the process performance, ran process tests, evaluated product quality, and provided general support to operations. One of my assignments was to be Project Team Leader to bring a new pharmaceutical product to the Plant. This involved managing the design, construction, and start up of the new system.

1988 to 1989
Title & Location: Senior Engineer; DuPont, Wilmington Del.
Worked on the development and design of the world’s first process to produce an Ozone safe refrigerant; i.e., “SUVA” 134a. This involved pilot plant liaison work, design development, equipment inspections, basic data, etc.

1985 to 1988
Title & Location: R&D Engineer; DuPont, Corpus Christi, Tx.
Worked at the DuPont Corpus Christi Plant as a Process Engineer for the Aqueous HCL and “Freon” 113 Processes

1982 to 1985
Title & Location: Environmental Coordinator, DuPont, Montague Mich.
In this position I had responsibility for all environmental activities at the DuPont Montague Plant.

1973 to 1982
Title & Location: Engineer; DuPont, Memphis Tenn.
Worked at the DuPont Memphis Plant as a Process Engineer in the Acrylonitrile, the HCN, and the Waste Water Processes.

Shinya Ochiai
Native of Japan.

Education:
BSME, Waseda University, Tokyo, Japan, 1960.
MSME, Rice University, 1962.  Major: Automatic Control
Ph.D., Purdue University, 1966.  Major: Automatic Control

R&D Engineer, Technical Center of Fibers Industry Inc. (Joint Venture of Celanese and ICI of England), Charlotte, NC, 1967 - 68
Sr. Process Systems Engineer, Celanese Chemical Technical Center, Corpus Christi, TX, 1968 - 74

Engineering Associate, 1974 - 90

Part-time Visiting Associate Professor, Texas A&M University, Kingsville, 1974 - 75

Sr. Engineering Associate, 1990 - 2001 (retired on 12/31/01)

Adjunct Professor of Engineering Technology, Texas A&M University, Corpus Christi, January, 2002 - present

Works at the Celanese Chemical Technical Center:
   Chemical Process Analysis and Diagnosis, Dynamic Simulation and Development of Automatic Control System

**Professional Society Membership:** AIChE Member, ISA Fellow, Sigma Xi Member


Award: O. Hugo Schuck Best Paper award for 1974 American Automatic Control Conference