ATMAE Accreditation Self-Study Report
B.S. in Industrial Technology

SUBMITTED TO THE
BOARD OF ACCREDITATION
ASSOCIATION OF TECHNOLOGY, MANAGEMENT,
AND APPLIED ENGINEERING

In compliance with the 2011 Outcomes Assessment
Accreditation Handbook – Baccalaureate Level

Department of Technology
College of Engineering, Computer Science, and Technology
California State University, Los Angeles

March 18, 2013
Onsite Visit: April 17-19, 2013
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<th>NAME</th>
<th>ABBREVIATION(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Excellence Workshops</td>
<td>AEW</td>
</tr>
<tr>
<td>Appointment, Retention, Tenure and Promotion</td>
<td>ARTP</td>
</tr>
<tr>
<td>Association of Technology Management and Applied Engineering</td>
<td>ATMAE</td>
</tr>
<tr>
<td>Bachelor of Science in Industrial Technology</td>
<td>ITEC BS</td>
</tr>
<tr>
<td>California State University, Los Angeles</td>
<td>Cal State LA or CSULA</td>
</tr>
<tr>
<td>California State University System</td>
<td>CSU System</td>
</tr>
<tr>
<td>Center for Effective Teaching and Learning</td>
<td>CETL</td>
</tr>
<tr>
<td>Certified Manufacturing Technologist</td>
<td>CMfgT</td>
</tr>
<tr>
<td>Certified Manufacturing Specialist Exam</td>
<td>CMS</td>
</tr>
<tr>
<td>Certified Technology Manager Exam</td>
<td>CTM</td>
</tr>
<tr>
<td>Cisco Certified Network Associate Certification Exam</td>
<td>CCNA</td>
</tr>
<tr>
<td>College Board Advanced Placement Program</td>
<td>AP</td>
</tr>
<tr>
<td>College of Engineering, Computer Science and Technology</td>
<td>ECST or CECST</td>
</tr>
<tr>
<td>Computer Productivity Center (in the CECST)</td>
<td>CPC</td>
</tr>
<tr>
<td>Department of Energy</td>
<td>DoE</td>
</tr>
<tr>
<td>Instructional Affairs Committee</td>
<td>IAC</td>
</tr>
<tr>
<td>Engineering and Technology Building</td>
<td>E&amp;T</td>
</tr>
<tr>
<td>Faculty Early Retirement Program</td>
<td>FERP</td>
</tr>
<tr>
<td>Full-Time Equivalent Faculty</td>
<td>FTEF</td>
</tr>
<tr>
<td>Golden Eagle Territory</td>
<td>GET</td>
</tr>
<tr>
<td>Golden Eagle Territory Student Administration</td>
<td>GET/SA</td>
</tr>
<tr>
<td>Grade Point Average</td>
<td>GPA</td>
</tr>
<tr>
<td>Institutional Learning Outcomes</td>
<td>ILOs</td>
</tr>
<tr>
<td>Industry Advisory Board</td>
<td>IAB</td>
</tr>
<tr>
<td>MESA Schools Program</td>
<td>MSP</td>
</tr>
<tr>
<td>MESA Engineering Program</td>
<td>MEP</td>
</tr>
<tr>
<td>Moodle Learning Management System</td>
<td>LMS</td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>NSF</td>
</tr>
<tr>
<td>Office of Institutional Research</td>
<td>IR</td>
</tr>
<tr>
<td>Quarters: fall, winter, spring, summer</td>
<td>FA, WI, SP, SU</td>
</tr>
<tr>
<td>Strengths, Weakness, Opportunities, Threats</td>
<td>SWOT</td>
</tr>
<tr>
<td>Student Academic Support Services</td>
<td>SASS</td>
</tr>
<tr>
<td>Student Learning Outcomes</td>
<td>SLOs</td>
</tr>
<tr>
<td>Summer Transition into ECST Program</td>
<td>STEP</td>
</tr>
<tr>
<td>Technology</td>
<td>TECH</td>
</tr>
<tr>
<td>Weighted Teaching Unit</td>
<td>WTU</td>
</tr>
<tr>
<td>Western Association of Schools and Colleges</td>
<td>WASC</td>
</tr>
</tbody>
</table>
Welcome

In preparation for our self-study report, we have listed each of the 19 standards for accreditation in the Outcomes Assessment Accreditation Model followed by a statement addressing the standard and documentation of how we comply with each standard. The appendices also include additional documentation and will be available to the visiting team via the Department of Technology’s SharePoint server.

Definition of Terms

**Program**: A defined course of study leading to a degree that is denoted by a unique name on the official transcript.

**Option**: A subset of a program which may be denoted by a unique name on the official transcript.

(Program options are sometimes referred to as concentrations or specializations, this document will use the term option to represent program options, concentrations or specializations)

**Program Title**: The official approved title of the degree program being considered for accreditation.

**Program Mission**: A general statement which identifies the broad purpose of a program.

**General Outcomes**: A list of general expectations for “what” you expect students to achieve in the form of knowledge and skills.

**Competencies**: A series of measurable activities that demonstrate “how” students are achieving the desired outcomes.

**Competency Measures**: The activities used to determine if students have achieved a competency such as written tests, demonstrations and observations, case studies and discussion groups, exemplars, peer reviews, self-assessments, presentations, mock events and monitors.

**Outcome Measures**: A series of activities, using instruments such as surveys, undertaken after students have completed a program to determine the overall effectiveness of the outcomes and competencies identified and covered in the program.
Outcomes Assessment Accreditation Model

The objective of ATMAE accreditation is to ensure that programs in Technology, Management and Applied Engineering that are accredited meet established standards and that outcome measures are used to continuously improve programs. The “Outcomes Assessment Accreditation Model” requires that consideration be given to both the qualitative and quantitative criteria set forth in these standards.
PA.1 Preparation of Self-Study

The Self-Study Report shall follow the guidelines and be completed by a representative portion of the institution’s administrative staff, teaching faculty, and students. The Self Study Report shall show how each program and program option meets each standard. Please note: If a program has one or more associated options, all options must stand for accreditation.

The following individuals assisted in preparing this report:

**Administration:**
- Dr. Cheryl Ney, Associate Vice President for Academic Affairs
- Dr. Keith Moo-Young, Dean/ECST
- Dr. Benjamin Lee, Associate Dean/ECST
- Dr. Steven Jones, Acting Dean Undergraduate Studies
- Dr. David Connors, Acting Director of Program Review and Assessment
- Dr. Philip Lapolt, Assistant Vice President for Academic Affairs, Academic Personnel
- Mae Santos, Assistant Vice President and University Budget Director
- Jen Chen, Senior Institutional Research Data Administrator
- Kingdon Chew, Senior Network Analyst/ITS - IT Infrastructure Services

**College of Engineering, Computer Science, and Technology Staff:**
- Janet L. MacMichael – Consultant: professional report writer, accreditation specialist
- Jo Ann Hundley-Mitchell, Administrative Support Coordinator
- Fernando Loza, ECST Instructional Computing Consultant
- Yin Tam, ECST Instructional Computing Consultant

**Department of Technology Teaching faculty:**
- Dr. David Blekhman, Power, Energy, and Transportation
- Dr. Mauricio Castillo, STEM
- Dr. Jai Hong, Manufacturing Processes & Automation
- Dr. Ethan Lipton, Graphic Communications
- Dr. Paul Liu, Manufacturing Processes & Automation
- Dr. Keith Mew, Department Chair
- Dr. Stephanie Nelson, Written Communication Skills
- Dr. Virgil Seaman, Computer-Integrated Design
- Dr. Le Tang, Internetworking
**Student**

Blake Cortis, Hydrogen Station Technician

**PA.2 Program Definition:**

A program is a set of courses leading to a degree. A program may have more than one option, specialization or concentration, but specific course requirements for each option shall be clearly specified, and as appropriate all program/options shall meet ATMAE standards. In situations where an option is not appropriate for ATMAE accreditation based upon the approved definition of technology, management, and applied engineering, the request for accreditation should clearly state which option, concentration, or specialization is seeking accreditation and which ones are excluded.

The case for exclusion should be made with the application for accreditation. If an option, concentration, or specialization is excluded and the program becomes accredited, the program must identify specifically which concentrations, options and specializations are and are not accredited in all their publications and promotional materials that mention accreditation.

The program that is being reviewed for accreditation does not have options or specializations. This program is a standalone degree.

**Bachelor of Science in Industrial Technology**

The Industrial Technology program prepares graduates for careers in industry and education.

http://ecatalog.calstatela.edu/preview_program.php?catoid=4&poid=504&hl=%22industrial+technology%
General Information

The Institution

California State University, Los Angeles\(^1\), founded in 1947 by the California State Legislature, is a comprehensive university that has been fully accredited by WASC since 1954. It is one of 23 campuses in the California State University (CSU) system.

Located just five miles east of downtown Los Angeles, the campus sits on 175 hilltop acres and has views of Pasadena and the mountains to the north, the San Gabriel Valley to the east, downtown Los Angeles to the west, and the Palos Verdes Peninsula and Catalina Island to the south. Its urban location allows many of the students, faculty and staff to commute to campus via the numerous trains and busses from throughout the region that stop at the campus Transit Center.

The University’s six colleges offer 60 undergraduate degree programs, 56 master degree programs, an Education Doctorate (Ed.D.), a joint Doctorate in Nursing Practice (DNP) with CSU Long Beach and CSU Fullerton, and a joint Ph.D. in Special Education with UCLA. Thirteen discipline-specific accreditation bodies accredit respective Cal State L.A. programs – a testament to program quality.

The University also has an Honors College and a College of Extended Studies and International Programs.

About one quarter of the more than 20,000 students on campus are engaged in post baccalaureate study in programs leading to master and doctoral degrees; teaching, service, and specialist credentials; certificates; and programs that lead to professional and academic advancement.

CSULA operates on the quarter system, offering three quarters in the academic year - fall, winter, and spring. Classes are scheduled weekdays from 7 a.m. until 10 p.m. and on Saturdays to serve the needs of both full-time and part-time working students.

\(^1\) a/k/a Cal State LA, and CSULA
Since Summer Quarter 2010, summer offerings and mode of support (state supported or through extended education) have varied.

Faculty, staff, and administrators continue to support the University’s goals of excellence and access for students. Administrative leadership has been sustained by Dr. James M. Rosser, who has just completed his 33rd year as University President and will be retiring in June, 2013. There have been a number of recent hires in leadership positions since the start of the 2010-11 academic year, including the following:

- Provost and Vice President for Academic Affairs
- Assistant Vice President for Academic Affairs for Academic Personnel
- Dean of the College of Arts and Letters
- Dean of the College of Business and Economics
- Dean of Graduate Studies and Research.

The main focus of the more than 500 tenured and tenure track faculty members is on teaching; a combination of research, scholarship, creative activity; and service. More CSULA faculty members have been recognized as outstanding professors at the CSU system level than faculty at any other CSU campus. Faculty members regularly involve students, including undergraduates, in research, scholarship, and creative activities, and mentor them through academic and career advisement. CSULA ranks high among CSU campuses in the number of extramural grant and contract funds raised annually per full-time faculty member, with more than $27 million in grants and contracts generated in 2011-12 academic year.

Profile of the Student Population at Cal State LA

CSULA serves one of the most ethnically, linguistically, and socio-economically diverse populations in the nation. It serves predominately first generation minority and non-traditional students for whom a college education is hard-won. Among CSU campuses, CSULA is second in the percent of underrepresented students and first in the percent of Latino students.

The fall of 2011 enrollment was 20,034 students, which closely reflects the local demographics. The minority student enrollment exceeds 86% of the student body, with 6% African Americans, 54% Hispanics, 0.2% American Indians/Alaskan Native, 17% Asians, 0.13% Pacific Islanders, 9% non-Hispanic White, and 16% undeclared or international student, all of which can be seen in Figure 1 on the next page.

The average age of undergraduates is 24, and women make up 59% of the student body. For a large number of students, English is a second language, with more than half of the entering transfer students (52%) having learned English as a second language.

Undergraduates have a median family income of less than $30,000 per year. According to the entering freshman and transfer student surveys, many students express concern
about their ability to finance their education. Transfer students generally report more concern as a whole because a portion of them are financially independent. Seventy-one percent of the students were eligible for the federal Pell Grant in 2011, which is among the highest eligibility of any university in the nation.

![Student Demographic Profile by Ethnicity](image)

**Figure 1 Student Demographics by Ethnicity**

We have found that most incoming undergraduates are not familiar with what it takes to succeed in college, and in most cases their parents are unable to assist them. Almost 80% of incoming students come from families in which neither parent has earned a college degree.

The majority of students have graduated from large urban high schools in Los Angeles that have the highest dropout rates and lowest test score performances in California. As a result, many students enter CSULA and feeder community colleges with poor English and math skills, despite the fact that they are high school graduates, are regularly admissible, and meet the CSU criteria for admissions. CSULA has an entering freshman cohort with one of the lowest percentages of proficiency in math and English in the CSU system, as shown in Table 1 below:
Table 1 Percentage of Freshmen Proficient in English and Math

<table>
<thead>
<tr>
<th>Freshmen Enrollment</th>
<th>Proficiency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CSULA (fall 2011)</td>
<td>22%</td>
<td>37%</td>
</tr>
<tr>
<td>All campuses (fall 2010)</td>
<td>51%</td>
<td>65%</td>
</tr>
</tbody>
</table>

Specific information related to this institution is as follows:

1. Name and address of Institution

   California State University, Los Angeles  
   5151 State University Drive  
   Los Angeles, California 90032

2. Number of Students Enrolled

   The number of students enrolled at Cal State L.A. is shown below in Table 2. The total full-time equivalent faculty for fall 2012-2013 is 757.

Table 2 Cal State LA Enrollment

<table>
<thead>
<tr>
<th>Total Enrollment</th>
<th>Fall 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Enrollment</td>
<td>21,284</td>
</tr>
<tr>
<td>Undergraduate (FTES)</td>
<td>15,639</td>
</tr>
<tr>
<td>Lower Division</td>
<td>7,163</td>
</tr>
<tr>
<td>Upper Division</td>
<td>8,476</td>
</tr>
<tr>
<td>Graduate (FTES)</td>
<td>1,670</td>
</tr>
<tr>
<td>Full-Time Equivalent</td>
<td>17,309</td>
</tr>
</tbody>
</table>

3. Operating Budget

   The operating budget for the 2012-2013 fiscal year is $208,347,213.

4. General Operating Budget

   The general operating budget for the last five years is shown below in Table 3.
### Table 3 – General Operating Budget

<table>
<thead>
<tr>
<th>Fiscal Years</th>
<th>2008/09</th>
<th>2009/10</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Operating Budget</td>
<td>$206,093,149</td>
<td>$191,724,293</td>
<td>$208,615,372</td>
<td>$210,783,895</td>
<td>$208,347,213</td>
</tr>
<tr>
<td>Sponsored programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• grants and contracts</td>
<td>26,161,806</td>
<td>26,059,075</td>
<td>28,771,099</td>
<td>26,382,657</td>
<td>23,500,000</td>
</tr>
<tr>
<td>Private contributions</td>
<td>3,121,070</td>
<td>1,392,399</td>
<td>1,499,712</td>
<td>932,308</td>
<td>2,857,519</td>
</tr>
</tbody>
</table>

*Note: With the exception of Fiscal Year 2012-13 data, all other years are based on audited Actuals financial data for Sponsored Programs and Private Contributions.*

The instructional and operational budget is been primarily state-assisted. These funds are augmented by student fees, federal reimbursements, and self-supporting activities such as parking fees, and extended education programs.

5. Institutional Accreditation Organizations and Dates of Accreditation.

Since 1954, California State University, Los Angeles has been fully accredited by the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges (WASC).

WASC is one of six regional voluntary non-governmental agencies authorized by the Department of Education to grant accreditation to schools, colleges and universities. *The Accrediting Commission for Senior Colleges and Universities* is responsible for the evaluation of the quality and effectiveness of colleges and universities offering the baccalaureate degree and above in California, Hawaii, Guam and the Pacific Basin.

The cycle of accreditation is normally ten years, during which institutions involve their constituencies in a reflective process of self study and evaluation. There are three definite stages to the accreditation process:

1. Institutional Proposal
2. Capacity and Preparatory Review
3. Educational Effectiveness Review

California State University, Los Angeles was reaccredited by WASC 2011. In addition to accreditation by WASC, California State University, Los Angeles also holds accreditation from specialized accrediting agencies together with recognition and licensure from boards such as ABET. A list of each program’s review bodies and their most recent accreditation dates appear in Table 2 below.
Table 2 – List of Specialized Agencies and Boards

<table>
<thead>
<tr>
<th>AGENCY OR BOARD</th>
<th>PHONE</th>
<th>MOST RECENT DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WESTERN ASSOCIATION OF SCHOOLS AND COLLEGES</td>
<td>(510) 748-9001</td>
<td>2011</td>
</tr>
<tr>
<td>Art</td>
<td>(703) 437-0700</td>
<td>2010</td>
</tr>
<tr>
<td>National Association of Schools of Art and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11250 Roger Bacon Drive, Suite 21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reston, VA 20190</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audiology (graduate)</td>
<td>(301) 897-5700</td>
<td>2008</td>
</tr>
<tr>
<td>American Speech-Language-Hearing Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10801 Rockville Pike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockville, MD 20852</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Administration</td>
<td>(314) 872-8481</td>
<td>2011</td>
</tr>
<tr>
<td>The Association for Management Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600 Emerson Road, Suite 300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Louis, MO 63141-6762</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>(410) 347-7700</td>
<td>2011-12</td>
</tr>
<tr>
<td>ABET</td>
<td></td>
<td>(in process)</td>
</tr>
<tr>
<td>111 Market Place, Suite 1050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baltimore, MD 21202</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dietetics (coordinated undergraduate program)</td>
<td>(312) 899-0040</td>
<td>2003</td>
</tr>
<tr>
<td>American Dietetic Association</td>
<td>Ext. 4876</td>
<td>Next review</td>
</tr>
<tr>
<td>216 W. Jackson Blvd., Suite 800</td>
<td></td>
<td>09/01/13</td>
</tr>
<tr>
<td>Chicago, IL 60606-6995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>(202) 466-7496</td>
<td>2012</td>
</tr>
<tr>
<td>National Council for Accreditation of Teacher Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010 Massachusetts Ave., NW, Suite 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington, DC 20036</td>
<td>(916) 445-0184</td>
<td>2012</td>
</tr>
<tr>
<td>California Committee on Accreditation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1900 Capitol Avenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sacramento, CA 95814</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering (undergraduate)</td>
<td>(410) 347-7700</td>
<td>2011-12</td>
</tr>
<tr>
<td>B.S. degrees in Civil, Electrical, and</td>
<td></td>
<td>(in process)</td>
</tr>
<tr>
<td>Mechanical Eng.</td>
<td></td>
<td></td>
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<tr>
<td>ABET</td>
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<tr>
<td>111 Market Place, Suite 1050</td>
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<td></td>
</tr>
<tr>
<td>Baltimore, MD 21202</td>
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<td></td>
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<tr>
<td>Music</td>
<td>(703) 437-0700</td>
<td>2006</td>
</tr>
<tr>
<td>National Association of Schools of Music</td>
<td></td>
<td></td>
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<tr>
<td>11250 Roger Bacon Drive, Suite 21</td>
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<td></td>
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<tr>
<td>Reston, VA 20190</td>
<td></td>
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</table>
### Table 2 – List of Specialized Agencies and Boards

<table>
<thead>
<tr>
<th>AGENCY OR BOARD</th>
<th>PHONE</th>
<th>MOST RECENT DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>(800) 669-1656</td>
<td>2007</td>
</tr>
<tr>
<td>National League for Nursing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 Broadway, 33rd Floor, New York, NY 10006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Association for Behavior Analysis: International</td>
<td>(616) 387-8341</td>
<td>2007</td>
</tr>
<tr>
<td>213 West Hall, Western Michigan University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalamazoo, MI 49008-5052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology (graduate)</td>
<td>(616) 387-8341</td>
<td>2007</td>
</tr>
<tr>
<td>Association for Behavior Analysis: International</td>
<td></td>
<td></td>
</tr>
<tr>
<td>213 West Hall, Western Michigan University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kalamazoo, MI 49008-5052</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Administration (graduate)</td>
<td>(202) 628-8965</td>
<td>2008</td>
</tr>
<tr>
<td>National Association of Schools of Public Affairs and Administration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1120 G Street, Suite 730, NW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washington, DC 20005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rehabilitation Counseling (graduate)</td>
<td>(847) 944-1345</td>
<td>2009</td>
</tr>
<tr>
<td>Council on Rehabilitation Education</td>
<td></td>
<td></td>
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<tr>
<td>1699 E Woodfield Road, Suite 300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schaumburg, IL 60173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Council for Accreditation of Counseling and Related Educational Programs</td>
<td>(703) 823-9800 Ext. 301</td>
<td>2009</td>
</tr>
<tr>
<td>5999 Stevenson Ave.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alexandria, VA 22304-3300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Work (BA accredited; MSW in candidacy)</td>
<td>(703) 683-8080</td>
<td>2005</td>
</tr>
<tr>
<td>Council on Social Work Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1725 Duke Street, Suite 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alexandria, VA 22314-3457</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech-Language Pathology (graduate)</td>
<td>(301) 897-5700</td>
<td>2008</td>
</tr>
<tr>
<td>American Speech-Language-Hearing Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10801 Rockville Pike</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockville, MD 20852</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. History of Accreditation by the Association of Technology, Management, and Applied Engineering

No previous history of accreditation. This is an initial accreditation for the B.S. Industrial Technology program.

7. Administration of the Institution

California State University, Los Angeles (CSULA) is one of twenty-three campuses in the California State University (CSU) system with 427,000 students and 44,000 faculty and staff. The chief executive officer of CSULA with responsibility to the campus is Dr. James M. Rosser (President). Dr. Rosser’s administrative superior is Timothy P. White, Chancellor of the CSU. As appropriate, the President delegates specific duties and responsibilities to members of his campus administration.

There are five primary divisions in the University each with an appointed Vice-President: Academic Affairs, Student Affairs, Administration and Finance, Information Technology Services, and Institutional Advancement. Each Vice-President reports directly to the President. The Academic Senate and the Executive Committee of the Academic Senate assist the President with campus-related policy issues and decisions. The Executive Committee plans the actions of the Senate including the agenda and serves as a link between the Standing Committees and the Academic Senate. The names of the President and each Vice-President are listed below:

- Dr. James M. Rosser, President
- Dr. Ashish Vaidya, Provost and Vice President for Academic Affairs
- Dr. Tony Ross, Vice President for Student Affairs
- Lisa Chavez, Vice President for Administration and Chief Financial Officer
- Peter Quan, Vice President for Information Technology Services
- Kyle Button, Vice President for Institutional Advancement

Faculty members and students have a major role in the governance of the University through the Academic Senate, which is the official representative body of the faculty. The Senate recommends policy to the President. If the President rejects a Senate proposal, the Chair of the Senate is informed in writing of the compelling reasons for rejection of the Senate recommendation. All full-time members of the faculty are eligible for election to the Senate, whose membership also includes five student voting members and one emeritus faculty voting member.

Faculty members and students participate in the governance of the University by their service both as members of the Senate, and as members of the university-wide standing committees and various subcommittees which are agencies of the Senate in the determination of internal policies. There are five policy committees of the Academic Senate: The Nominations Committee, Educational Policy Committee, Faculty Policy Committee, Fiscal Policy Committee, and Student Policy Committee.
Each standing committee has elected faculty members, student members, and an administrator serving ex-officio as executive secretary.


8. Major Academic Units within the Institution

Cal State L.A. is organized into the following academic units:

1. College of Arts and Letters (A&L)
2. College of Business and Economics (B&E)
3. Charter College of Education
4. College of Engineering, Computer Science, and Technology (ECST)
5. College of Health and Human Services (HHS)
6. College of Natural and Social Sciences (NSS)
7. Honors College
8. College of Extended Studies and International Programs
   - American Culture and Language Program
   - Extension Programs
   - English Language Program
   - International Office

The Deans from the major academic units are a part of the Academic Affairs Management Group (AAMG) headed by the Provost and Vice President for Academic Affairs.
9. Institutional Mission and Goals

In 2010 under the leadership of President James M. Rosser and Ashish Vaidya, Provost and Vice President for Academic Affairs the Strategic Planning Coordination Committee was reconvened to update the strategic plan. Cal State L.A. has developed a strategic plan for the period of 2011-2016 containing the University mission, vision and goals which is available at https://spcc.calstatela.edu/.

Mission Statement

Cal State L.A., a member of the California State University system, offers excellent and innovative educational opportunities to an urban student population that reflects the diversity of the Los Angeles Basin.

Through these educational opportunities, we expect our students to expand and deepen their interdisciplinary and general understanding of the world, enhance their intellectual and practical skills, and take responsibility for a lifetime of learning. As graduates they will become individuals who engage, enhance, and contribute to a democratic and global society.

Cal State L.A. has identified the following Institutional Learning Outcomes:

- Knowledge: Mastery of content and processes of inquiry
- Proficiency: Intellectual skills
- Place and Community: Urban and global mission
- Transformation: Integrative learning

Vision Statement

California State University, Los Angeles will be nationally recognized as a leader in transforming student lives through effective learning and community engagement in a diverse urban setting.
Goals (Strategic Initiatives)

I. Student Success

Cal State L.A. will pursue student success by:

- Providing access to and delivering highly-valued academic and co-curricular experiences, including student engagement in research, scholarship, and creative activities and other related high impact practices.
- Addressing educational pipeline issues to promote college readiness for students in our local service area.
- Retaining and graduating students in a timely manner with special emphasis on closing the achievement gap.
- Facilitating students’ post baccalaureate professional/career aspirations.

II. Community Engagement: Resources, Recognition, and Partnerships

Cal State L.A. will:

- Leverage knowledge and resources to serve our local, regional, national, and global communities.
- Graduate students who have learned how to put their knowledge into action for the benefit of those communities.
- Engage the community to promote social justice and economic development.
- Deepen and strengthen partnerships with communities and leaders in the LA Basin that result in a substantial increase in resources flowing to and from those communities, by building on our designation as a Minority and Hispanic Serving Institution.
- Earn recognition as a major higher education partner in the LA Basin.
- Align institutional priorities, processes, structures, image and resources with the goal of improving the level of community engagement.

III. Collaborative Culture: Working Together towards a Common Purpose

Cal State L.A. will:

- Enhance the culture of working collaboratively with shared values among all constituents of the University including faculty, staff, students, administrative personnel, alumni, families, friends, and other stakeholders.
- Promote the values of open communication, transparency, synergy through cooperation, and appropriate recognition of contributions and achievements.
- Encourage collaboration across departments, programs, areas, and colleges in order to diminish various silos of interest and encourage a culture that focuses on a commitment to the entire institution.
- Support an environment that promotes trust, respect for differences of opinion, and advances institutional excellence, innovation, and integration across the institution.
- Invest in and nurture campus human capital.
10. Relationship of Institution to Superior Governing Body

California State University, Los Angeles is a state-supported, public institution. It is one of 23 universities that comprise the California State University System (CSU). The CSU is governed by a Board of Trustees that is responsible for the oversight of the California State University. The Board adopts rules, regulations, and policies governing the California State University. The Board has authority over curricular development, use of property, development of facilities, and fiscal and human resources management. The 25-member Board of Trustees meets six times per year. Board meetings allow for communication among the trustees, chancellor, campus presidents, executive committee members of the statewide Academic Senate, representatives of the California State Student Association, and officers of the statewide Alumni Council.

The Trustees appoint the Chancellor, who is the Chief Executive Officer of the CSU system, and the Presidents, who are the chief executive officers of the respective 23 campuses.

The Trustees, Chancellor, and campus Presidents develop system-wide policy, with actual implementation at the campus level taking place through broadly-based consultative procedures. The Academic Senate of the California State University, made up of elected representatives of the faculty from each campus, recommends academic policy to the Board of Trustees through the Chancellor.

B. Administrative Unit(s) Information

1. Name and Address of College and/or Department Administrative Unit(s)

The Department of Technology is one of five departments administered in the College of Engineering, Computer Science, and Technology.

College of Engineering, Computer Science, and Technology (323) 343-4500
Engineering and Technology Building, A-236
California State University, Los Angeles
5151 State University Drive
Los Angeles, CA 90032

Department of Technology (323) 343-4550
College of Engineering, Computer Science, and Technology
Engineering and Technology Building, A-337
California State University, Los Angeles
5151 State University Drive
Los Angeles, CA 90032
2. Name of Dean, Associate Dean, and Department Head

Dr. Keith Moo-Young, Dean  
College of Engineering, Computer Science, and Technology

Dr. Benjamin Lee, Acting Associate Dean  
College of Engineering, Computer Science, and Technology

Dr. Keith Mew, Chair  
Department of Technology

3. Names of other Departments in Administrative Unit

The Department of Technology is seeking initial accreditation of its B.S. degree in Industrial Technology. The Department of Technology is one of five academic departments in the College of Engineering, Computer Science, and Technology. The other four departments in the college are:

- Dr. Raj Pamula  
  Chair, Computer Science
- Dr. Fred Daneshgaran  
  Chair, Electrical Engineering
- Dr. Rupa Purasinghe  
  Chair, Civil Engineering
- Dr. Darrell Guillaume  
  Chair, Mechanical Engineering

4. Name of Program Heads

The Department of Technology offers four undergraduate degrees and one graduate degree: Bachelor of Science in Aviation Administration, Bachelor of Science in Fire Protection Administration, Bachelor of Science in Graphic Communications, Bachelor of Science in Industrial Technology, and a Master of Arts in Industrial and Technical Studies.

- Dr. Keith Mew, Department Chair  
  B.S. Aviation Administration

- Dr. Ray Shackelford, Coordinator and Advisor  
  B.S. Fire Protection Administration

- Dr. Ethan Lipton, Coordinator and Advisor  
  B.S. Graphic Communications

- Dr. Virgil Seaman, Coordinator and Advisor  
  B.S. Industrial Technology

- Dr. Le Tang, Graduate Coordinator  
  M.A. Industrial and Technical Studies
5. Names and Titles of Others with Program Administration and/or Coordination Responsibility

Within the Department of Technology, there are additional faculty and staff members who assist with program administration and coordination. They are:

Dr. Mauricio Castillo  
Program Advisor, Industrial Technology

Dr. Stephanie Nelson  
Program Advisor, Fire Protection and Administration

JoAnn Hundley-Mitchell  
Administrative Support Coordinator

Regarding program administration within the College of Engineering, Computer Science, and Technology, Dean Keith Moo-Young meets regularly with Chairs and his administrative directors and staff to furnish current information concerning College business and to solicit their input with regard to his administration. He works with the Associate Dean, Dr. Benjamin Lee, in the College who oversees the day-to-day operations of the College.

Dean Moo-Young works with Deans in the five other Colleges and with Dr. Lawrence Fritz, Dean for Graduate Studies and Research and Dr. Steven Jones, Acting Dean of Undergraduate Studies.

The College also has a variety of elected faculty committees; committee membership reflects representation from the academic units within the College e.g., College and departmental Retention, Tenure and Promotion; Instructional Affairs; Faculty Affairs, Student Affairs; Assessment Task Force/ABET. These committees make recommendations to the Dean with reference to the tasks they are assigned to fulfill.

All of the Administrative Heads and staff listed below report to Dr. Keith MooYoung, Dean of the College:

Mr. Fernando Loza  
Director, Computer Productivity Center

Ms. Lily Nguyen  
Director, Strategic Alliance Initiative

Ms. Hasmik Simon  
Manager, Strategic Alliance Imitative

Ms. Frances Hidalgo-Segura  
Director, Student Academic Support Services
6. Titles of Degrees, Programs, and Concentrations for which Accreditation is being requested:

_Bachelor of Science, Industrial Technology (ITEC BS)_

### 7.1 Program Title, Mission, and General Outcomes

_The program/opti on title, definition and mission shall be compatible with the ATMAE definition of Technology, Management, and Applied Engineering. The program/opti on shall lead to a degree at the associate, bachelors, or master level. ATMAE approved definitions for degree programs are as follows:_

**Baccalaureate Degree**

_Programs/options that prepare individuals for positions that involve the management of complex technological systems._

The program title, definition, mission and general program outcomes are discussed below.

**Program Title:** Bachelor of Science in Industrial Technology (ITEC BS)

**Program Definition:** The Industrial Technology program prepares graduates for careers in industry and education.

“The Industrial Career Track emphasizes preparation for technical leadership responsibilities within a broad variety of industries including aerospace, communication, manufacturing, transportation and utility services. The areas of course concentration are computer integrated design, internetworking, graphic communications, manufacturing processes and automation and power/energy/transportation. Instruction includes laboratory experiences with a project design centered approach. Graduates of programs in industrial technology are called “technologists” to distinguish them from graduates of programs in engineering. Technologists apply management theory and practice with technical skills to solve problems.” — _CSULA Catalog_

The CSULA Industrial Technology program definition states that graduates apply management theory and practice with technical skills to solve problems. This definition reflects the new program which became effective fall 2008.

**Mission:** To provide quality innovative programs that transform practitioners into knowledgeable technologists and leaders for our ever-changing technological world.

**General Outcomes:** The Industrial Technology program has the following educational objectives and program outcomes for its graduates. The development of the educational objectives and outcomes began as part of an assessment process during the 1998-99 academic year organized by the then named School of Engineering and Technology. Under Dean Landis, the three engineering departments were ramping up for the next ABET accreditation and an Assessment Committee was formed with four members, one from each department including Dr. Keith Mew who represented the Department of Technology. Since then, the general outcomes listed below have been used to guide the program and used as part of the assessment process for the ATMAE accreditation effort.

The following describe the characteristics the Cal State L.A. Industrial Technology program is seeking to produce in its graduates in three areas:

- the *knowledge* they will have
- the *skills* they will possess
- the *attitudes* they will hold

Details of these characteristics are outlined on page three.

During the fall quarter (2012), the Department of Technology began a process to review all of the existing program outcomes for all departmental programs. The goal included reducing the large number of outcomes, making them more measurable, and aligning them with the institutional learning outcomes. As we move forward, the process includes soliciting input and feedback from faculty, our industrial advisory board and external experts.

**Measurable Competencies**

ATMAE’s standards for accreditation state, “Validation of the general outcomes shall be accomplished through a combination of external experts, an industrial advisory committee and, after the program is in operation, follow up studies of graduates.” (Standard 7.2). This will be discussed in sections 7.2 Competency Identification and Validation and 7.4 Identification of Competency Measures.

Legal Authorization to offer degree programs:

Cal State L.A. is accredited by the Western Association of Schools and Colleges.

[WASC - California State University, Los Angeles]
Industrial Technology graduates will demonstrate a balance of technical and managerial knowledge. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will have:

- knowledge of science, math and technical management
- understanding of the role of technical management in the public and private sector
- knowledge of systems and the integration of technologies
- knowledge of information technology including its use in a digital enterprise
- knowledge of contemporary technology/management issues

Industrial Technology graduates will demonstrate the skills needed to apply business practices, information technology, and other technical skills necessary to collaborate with, organize, and lead inter-disciplinary teams. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will be able to:

- apply theories and principles to solve technical and management problems
- design, test and analyze a system or process to meet desired needs
- good written and oral communication and presentation skills
- exhibit supervisory and team leadership skills
- collect, analyze and interpret data
- collaborate within a digital enterprise with a multi-disciplinary project team
- select and use computer applications software associated with desired needs

Industrial Technology graduates will demonstrate a cooperative and inquisitive spirit that supports the desire to pursue lifelong learning and enables them to adapt to contemporary issues in the workplace, and helps advance the goals of their organization. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will:

- have an understanding of ethical responsibility
- exhibit professionalism in their area of expertise
- have a recognition of the need for, and an ability to engage in lifelong learning
- stay current on issues
- achieve a balance of workplace and personal goals
- exhibit the desire to adopt emerging technologies to improve their area of expertise
- support and promote the goals of their organization

<table>
<thead>
<tr>
<th>KNOWLEDGE</th>
<th>SKILL</th>
<th>ATTITUDES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Technology graduates will demonstrate a balance of technical and managerial knowledge. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will have:</td>
<td>Industrial Technology graduates will demonstrate the skills needed to apply business practices, information technology, and other technical skills necessary to collaborate with, organize, and lead inter-disciplinary teams. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will be able to:</td>
<td>Industrial Technology graduates will demonstrate a cooperative and inquisitive spirit that supports the desire to pursue lifelong learning and enables them to adapt to contemporary issues in the workplace, and helps advance the goals of their organization. In demonstrating this educational objective, graduates will exhibit the following outcomes. They will:</td>
</tr>
<tr>
<td>- knowledge of science, math and technical management</td>
<td>- apply theories and principles to solve technical and management problems</td>
<td>- have an understanding of ethical responsibility</td>
</tr>
<tr>
<td>- understanding of the role of technical management in the public and private sector</td>
<td>- design, test and analyze a system or process to meet desired needs</td>
<td>- exhibit professionalism in their area of expertise</td>
</tr>
<tr>
<td>- knowledge of systems and the integration of technologies</td>
<td>- good written and oral communication and presentation skills</td>
<td>- have a recognition of the need for, and an ability to engage in lifelong learning</td>
</tr>
<tr>
<td>- knowledge of information technology including its use in a digital enterprise</td>
<td>- exhibit supervisory and team leadership skills</td>
<td>- stay current on issues</td>
</tr>
<tr>
<td>- knowledge of contemporary technology/management issues</td>
<td>- collect, analyze and interpret data</td>
<td>- achieve a balance of workplace and personal goals</td>
</tr>
<tr>
<td></td>
<td>- collaborate within a digital enterprise with a multi-disciplinary project team</td>
<td>- exhibit the desire to adopt emerging technologies to improve their area of expertise</td>
</tr>
<tr>
<td></td>
<td>- select and use computer applications software associated with desired needs</td>
<td>- support and promote the goals of their organization</td>
</tr>
</tbody>
</table>
7.2 Competency Identification and Validation

Measurable competencies shall be identified and validated for each program/option. These competencies must closely relate to the general outcomes established for the program/option and validation shall be accomplished through a combination of external experts, an industrial advisory committee and, after the program is in operation, follow-up studies of program graduates.

The alignment of the 19 Industrial Technology program outcomes to the University’s four Institutional Learning Goals is discussed below and followed by how student learning outcomes for courses within the Required Core of the major were aligned to the educational objectives and program outcomes. A follow-up study involved surveying our alumni to seek their input to validate the knowledge, skills, and attitudes educational objective areas and associated program outcomes. Finally, we discuss the role of our Industrial Advisory Board in validating program outcomes and rating the importance of workplace competencies. We believe we are effectively moving forward in identifying and aligning workplace competencies to our program outcomes.

As a part of its WASC Regional Accreditation process California State University, Los Angeles developed a series of Institutional Learning Goals that were approved by President Rosser in 2010. As stated by the University “California State University, Los Angeles students expand and deepen their interdisciplinary and general understanding of the world, enhance their critical skills, and take responsibility for a lifetime of learning, and as graduates become individuals who engage, enhance, and contribute to democratic society.” The four primary institutional goals are:

<table>
<thead>
<tr>
<th>No.</th>
<th>Institutional Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Knowledge: Mastery of content and processes of inquiry</td>
</tr>
<tr>
<td>2.</td>
<td>Proficiency: Intellectual skills</td>
</tr>
<tr>
<td>3.</td>
<td>Place and Community: Urban and global mission</td>
</tr>
<tr>
<td>4.</td>
<td>Transformation: Integrative learning</td>
</tr>
</tbody>
</table>

In Table 7.2.1 on the next page, the University has identified objectives, outcomes, and suggested assessment measures within each of the institutional goals. These are provisional. The learning goals are approved and in use.

Competency Identification

Program outcomes for Industrial Technology were originally developed and adopted by the Department of Technology back in 1998/99 as part of a University initiative to promote program-based assessment. At that time, the Industrial Technology program offered options in: Aviation Administration, Printing Management and Production Technology. Three separate sets of program outcomes were developed, one for each of the three options. The outcomes for the Production Technology option carried over to the new B.S. Industrial Technology program when it was officially approved in fall 2008.

The program outcomes align with Institutional Goal no. 2 listed below in Table 7.2.1.

Institutional goal No. 2 - Proficiency in Intellectual Skills lists these outcomes:
1. Critical Thinking
2. Reading, Writing, and Speaking
3. Quantitative Reasoning
4. Information Literacy
5. Problem Solving

These five outcomes have objectives, some of which refer to their application to the discipline. The outcomes listed above subsume the outcomes within the Industrial Technology program.
### Table 7.2.1 — Institutional Goals, Objectives and Outcomes for CSULA

**OBJECTIVES AND OUTCOMES**

<table>
<thead>
<tr>
<th>KNOWLEDGE: MASTERY OF CONTENT AND PROCESSES OF INQUIRY</th>
<th>ASSESSMENT MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Understand and apply the scientific method</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>2. Demonstrate an understanding of human beings as physiological, psychological, social and spiritual people</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>3. Compare and contrast multiple cultural endeavors in the arts and humanities and the legacies of world civilizations</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>4. Utilize perspectives of the different disciplines to analyze broader questions facing society now and in the future</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROFICIENCY: INTELLECTUAL SKILLS</th>
<th>ASSESSMENT MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Critical thinking — Assessment determined at the program level</td>
<td>Demonstrates advanced reasoning in the discipline</td>
</tr>
<tr>
<td>2. Reading, writing and speaking</td>
<td>a. Write to inform, explain, describe, or define a subject</td>
</tr>
<tr>
<td></td>
<td>b. Demonstrate the ability to write in the discipline — upper division writing assignment</td>
</tr>
<tr>
<td></td>
<td>c. Make an oral argument and respond to questions</td>
</tr>
<tr>
<td>3. Quantitative reasoning</td>
<td>a. Perform computations and symbolic manipulations</td>
</tr>
<tr>
<td></td>
<td>b. Demonstrate quantitative reasoning appropriate to the discipline</td>
</tr>
<tr>
<td>4. Information literacy</td>
<td>Demonstrates information seeking, management and evaluation of source appropriate to the discipline</td>
</tr>
<tr>
<td>5. Problem solving</td>
<td>Team work: Function effectively in a cross-cultural environment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLACE: URBAN AND GLOBAL MISSION</th>
<th>ASSESSMENT MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Demonstrate personal and social responsibility via individual and group effort including engagement with their local communities</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>2. Demonstrate an understanding of social issues and the ideals of a multicultural society</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>3. Recognize, analyze, and help to solve issues of civic and ethical concern in local and global communities</td>
<td>✓ ✓ ✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRANSFORMATION: INTEGRATIVE LEARNING</th>
<th>ASSESSMENT MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Conduct a community, creative scholarly or research project</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>2. Demonstrates lifelong learning dispositions</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>3. Articulate and reflect on the benefits of their educational experience</td>
<td>✓ ✓ ✓</td>
</tr>
</tbody>
</table>
Below are the program outcomes for the B.S. Industrial Technology program, which are measurable and are aligned to the intellectual skills outcomes (listed above):

1. Use science, mathematics and technical management to solve problems.
2. Identify and analyze the role technical management plays in public and private sector.
3. Select appropriate technologies for systems integration.
4. Select information technologies in their field.
5. Resolve contemporary technical and management-related issues.
6. Apply theories and principles to solve technical and management problems.
7. Design, test and analyze a system or process.
8. Write, speak and present technical information.
9. Supervise and lead project teams.
10. Collect, analyze and interpret data.
11. Collaborate as a member of a multi-disciplinary team.
12. Select and use computer applications software based on needs.
13. Understanding ethical responsibility
14. Exhibit professionalism in their area of expertise.
15. Engage in life-long learning
17. Balance workplace and personal goals.
18. Adopt emerging technologies to improve their area of expertise.
19. Support and promote the goals of their organization.

Student Learning Objectives Alignment with Program Outcomes

The process of aligning the student learning objectives with program outcomes evolved over time, as follows:

2000  Program outcomes were displayed in framed prints in each of the laboratories; and program outcomes were identified for individual courses and published in course syllabi.

2008  Modification of the B.S. Industrial Technology Program
   • Modified our existing curriculum based on recommendations from the 2006 program review process.

2011+ Faculty who normally teach the required core courses went through a process to:
   • Align program outcomes associated with the University’s educational objectives: Knowledge, Skills, and Attitudes.
Identify SLOs in their course curriculum.

Identify which of the five knowledge outcomes, seven skill outcomes and seven attitude outcomes pertain to each SLO.

Introduce and publish SLOs and Program Outcomes in syllabi.
  - At the beginning of each quarter, faculty members cover course requirements and routinely address the SLOs for the course and discuss how they relate to program outcomes so the students will understand the importance of what they are expected to learn.

Once the process was established, the changes were implemented during each course’s next offering.

The required core courses are listed below in Table 7.2.2.

Table 7.2.2 – Required Core in the Industrial Technology Program

<table>
<thead>
<tr>
<th>DEPT. AND NO.</th>
<th>TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH 101</td>
<td>Industrial Safety for Industrial Education</td>
<td>3</td>
</tr>
<tr>
<td>TECH 150</td>
<td>Introduction to Higher education in Technology</td>
<td>2</td>
</tr>
<tr>
<td>TECH 301</td>
<td>Transition to Cal State LA for Technology Majors</td>
<td>2</td>
</tr>
<tr>
<td>TECH 305</td>
<td>Information Literacy for Technologists</td>
<td>2</td>
</tr>
<tr>
<td>TECH 310</td>
<td>The Design Process</td>
<td>3</td>
</tr>
<tr>
<td>TECH 330</td>
<td>Graphic Communications Processes and Materials</td>
<td>3</td>
</tr>
<tr>
<td>TECH 360</td>
<td>Modern Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>TECH 370</td>
<td>Power, Energy and Transportation</td>
<td>3</td>
</tr>
<tr>
<td>TECH 400</td>
<td>Written Communication Skills for Industrial Technology</td>
<td>4</td>
</tr>
<tr>
<td>TECH 421</td>
<td>Internetworking Technology</td>
<td>4</td>
</tr>
<tr>
<td>TECH 488</td>
<td>Fluid Power</td>
<td>3</td>
</tr>
<tr>
<td>TECH 489</td>
<td>Industrial Training Methods</td>
<td>4</td>
</tr>
<tr>
<td>TECH 495</td>
<td>Practicum in Industrial Technology</td>
<td>4</td>
</tr>
</tbody>
</table>

Program Outcomes Validation Process - Alumni Survey

In 2012, a survey about the “importance” of 19 program outcomes under the educational objective headings of: Knowledge, Skills and Attitudes was created and sent to 104 alumni (2007-2011). Alumni were asked to rate each outcome on a scale of 1 to 5, where 1 is most important.

Although forty-two, or 40% of the graduates responded, some did not answer all of the questions. The number of skipped questions is noted at the bottom of Tables 7.2.3-5.
Knowledge Outcomes

Forty-one of our alumni rated the level of importance of the five knowledge outcomes in the following descending order of importance:

1. Systems and the integration of technologies.
2. Science, math and technical management.
3. Understand the role of technical management in the public and private sector.
5. Information technology including its use in a digital enterprise.

Table 7.2.3 Alumni Rating of Five Educational Objectives
Skill Outcomes

Thirty-eight of our alumni rated the level of importance of the seven skill outcomes in the following descending order of importance:

1. Good written and oral communication and presentation skills.
2. Able to exhibit supervisory and team leadership skills.
3. Able to collect, analyze and interpret data.
4. Able to select and use computer applications software associated with desired needs.
5. Apply theories and principles to solve technical and management problems. Able to design, test and analyze a system or process to meet desired needs.
6. Able to collaborate within a digital enterprise with a multidisciplinary project team.

Table 7.2.4 – Alumni Rating of Seven Skill Outcomes

<table>
<thead>
<tr>
<th>Skill Outcome</th>
<th>Extremely Important</th>
<th>Very Important</th>
<th>Important</th>
<th>Somewhat Important</th>
<th>Not Important</th>
<th>N/A</th>
<th>Rating Average</th>
<th>Rating Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply theories and principles to solve technical and management problems.</td>
<td>47.4% (19)</td>
<td>44.7% (17)</td>
<td>5.3% (2)</td>
<td>0.0% (0)</td>
<td>2.6% (1)</td>
<td>0.0% (0)</td>
<td>1.66</td>
<td>38</td>
</tr>
<tr>
<td>Able to design, test and analyze a system or process to meet desired needs.</td>
<td>47.4% (18)</td>
<td>26.3% (10)</td>
<td>18.4% (7)</td>
<td>2.6% (1)</td>
<td>5.3% (2)</td>
<td>0.0% (0)</td>
<td>1.92</td>
<td>38</td>
</tr>
<tr>
<td>Good written, oral communication and presentation skills.</td>
<td>68.4% (26)</td>
<td>23.7% (9)</td>
<td>2.6% (1)</td>
<td>0.0% (0)</td>
<td>5.3% (2)</td>
<td>0.0% (0)</td>
<td>1.50</td>
<td>38</td>
</tr>
<tr>
<td>Able to exhibit supervisory and team leadership skills.</td>
<td>64.9% (24)</td>
<td>27.6% (10)</td>
<td>2.7% (1)</td>
<td>2.7% (1)</td>
<td>2.7% (1)</td>
<td>0.0% (0)</td>
<td>1.51</td>
<td>37</td>
</tr>
<tr>
<td>Able to collect, analyze and interpret data.</td>
<td>54.1% (20)</td>
<td>27.6% (10)</td>
<td>13.5% (5)</td>
<td>2.7% (1)</td>
<td>2.7% (1)</td>
<td>0.0% (0)</td>
<td>1.73</td>
<td>37</td>
</tr>
<tr>
<td>Able to collaborate within a digital enterprise with a multidisciplinary project team.</td>
<td>29.7% (11)</td>
<td>40.5% (15)</td>
<td>16.2% (6)</td>
<td>2.7% (1)</td>
<td>8.1% (3)</td>
<td>2.7% (1)</td>
<td>2.17</td>
<td>37</td>
</tr>
<tr>
<td>Able to select and use computer applications software associated with desired needs.</td>
<td>51.4% (19)</td>
<td>21.6% (8)</td>
<td>16.2% (6)</td>
<td>5.4% (2)</td>
<td>5.4% (2)</td>
<td>0.0% (0)</td>
<td>1.92</td>
<td>37</td>
</tr>
</tbody>
</table>
Attitude Outcomes

Thirty-seven of our alumni rated the level of importance of the seven attitude outcomes in the following descending order of importance:

1. Exhibit professionalism in their area of expertise.
2. Understand ethical responsibility.
   Balance of workplace and personal goals.
3. Recognize the need for, and an ability to engage in lifelong learning.
4. Exhibit the desire to adopt emerging technologies to improve their area of expertise.
   Support and promote the goals of their organization.
5. Stays current on issues.

Table 7.2.5 – Alumni Rating of Seven Attitude Outcomes
This feedback elicited from different constituencies in this evaluation process has made us realize that we need to revise our program outcomes. Beginning in winter quarter 2013, under the guidance of Dr. Ethan Lipton, the department is implementing the following changes:

- Reducing the number of program outcomes (currently 19) to a more manageable number. In addition, both the faculty and Industrial Advisory Board members have concerns that some of our current program outcomes are too difficult to measure. Another concern involved duplicate outcomes in multiple educational objective areas.
- The three educational objective headings (knowledge, skills, and attitudes) are encumbering and need to be eliminated.
- Align department outcomes with institutional learning outcomes.

**Workplace Competencies**

Workplace competencies help define what abilities graduates need in terms of knowledge, skills, attitudes, values and behaviors in order to be successful; and employers often express desired requirements in their job descriptions in terms of competencies. So, it is especially important that we have program outcomes that reflect what is expected of our graduates when they enter the workforce so they will be successful.

In addition, we need to be able to assess how well they are performing in their jobs and this is normally done through administering employer surveys. With the key actions associated with a competency, the workplace competency can be measured.

As part of our research to develop a survey instrument for employers, we became aware of a much larger effort conducted by faculty at Iowa State University. In 1999, engineering faculty members worked with a large number of employers, alumni, other faculty, and Development Dimensions International Inc., a provider of competency-based management tools and services and together, they identified and validated 14 workplace competencies associated with 11 ABET program outcomes. Note that one more, Safety Awareness, was added at a later date.

The Industrial Technology program contacted Dr. Steven Mickelson, Chair, Department of Agricultural and Biosystems Engineering at Iowa State University to ask for permission to incorporate the use of the fourteen workplace competencies and key actions. Permission was granted, and we moved forward with both faculty and industrial advisory board members to validate competencies for our Industrial Technology program.

More information on the Iowa State study can be found at:

http://lib.dr.iastate.edu/abe_eng_pubs/12/
The Workplace Competencies are:

1. Analysis and Judgment
2. Communication
3. Continuous Learning
4. Cultural Adaptability
5. Customer Focus
6. Technical Knowledge
7. General Knowledge
8. Initiative
9. Innovation
10. Integrity
11. Planning
12. Professional Impact
13. Quality Orientation
14. Safety Awareness
15. Teamwork

Each competency has a specific definition and associated multiple key actions. For more specific information on definitions and key actions, go to

http://learn.ae.iastate.edu/competencydefinitions.pdf

The importance of workplace competencies as stated in “The Data Are In: Student Workplace Competencies in the Experiential Workplace” indicates that employers look for what people can do with what they learn.

http://lib.dr.iastate.edu/abe_eng_conf/16

Competency Validation

Industrial Advisory Board Meeting — March 9, 2012

This meeting focused on:

1. The relationship between the required core and the educational objectives and program outcomes

2. Update on the Senior Exit Survey implementation.
Validating Workplace Competencies via the Industrial Advisory Board and Faculty

A survey was developed for the IAB to determine their potential value for the CSULA Industrial Technology program. The survey was distributed to the ten current members of the Industrial Advisory Board for them to rate the importance of the 13 of the 15 workplace competencies on a scale from 1 (extremely important) to 5 (not important). Members of the IAB rated a majority of the 13 workplace competencies as either being extremely important or very important with communication abilities (1.20) and integrity (1.30) rating the highest.

All ten members of the IAB responded and the results of the survey are shown below in Figure 7.2.5.

![Figure 7.2.5 – IAB Rating of Workplace Competencies](image)
The same survey provided to IAB members was distributed to the ten faculty members of the Department of Technology as a process for them to rate the importance of the 13 workplace competencies on a scale from 1 (extremely Important) to 5 (not important). All ten faculty members responded. The results of the survey are shown below in Figure 7.2.6.

![Importance of Workplace Competencies as Rated by Faculty](image)

Figure 7.2.6 – Dept. of Technology Faculty Rating of Workplace Competencies
It is interesting to note that both IAB and Faculty members rated the importance of Communication Abilities (1.20), Analysis and Judgment (1.60) and Cultural Adaptability (2.30) the same. A comparison of ratings is shown below in Figure 7.2.7.

**Figure 7.2.7 – IAB vs. Faculty Ratings of 13 Workplace Competencies**

**Workplace Competencies Mapped to Industrial Technology Program Outcomes**

Results of the workplace competencies surveys mentioned above are being shared with both IAB and Faculty members. The next logical step in the process will involve mapping workplace competencies and associating them with 19 Industrial Technology program outcomes and to then determine “core competencies” within the program.
Program Outcomes Update

The Industrial Advisory Board members had raised legitimate concerns about some of the program outcomes. They thought that some of the outcomes listed under the Attitudes Educational Objectives were difficult or impossible to measure, and the distinction between some of the outcomes in the Knowledge and Skills areas were blurred. In February 2013, the Department began a process to reduce the number of program outcomes from 19 to less than 10 in response to these aforementioned concerns. This process is ongoing and will be shared with the ATMAE accreditation team during the visit.

7.3 Transfer Coursework

The institution shall have policies in place to ensure that coursework transferred to the program is evaluated and approved by program faculty. All transfer coursework accepted must meet the ATMAE foundation course requirements for the program/option.

As part of the CSU system, California State University, Los Angeles has policies and procedures in place for students who apply as transfer students. University requirements for transfer student admission and procedures for evaluating transfer credit are discussed below, along with the B.S. Industrial Technology’s 23-unit foundation program on Assist.org. This online tool is used to verify if and how courses taken at California community college will be applied to lower-division core business requirements at CSULA. More information on Assist appears below in the section on evaluating transfer credit. All transfer coursework accepted meets ATMAE’s foundation course requirements and therefore, we believe we comply with this standard.

Transfer Student Admission

The Industrial Technology program follows the University admission requirements for transfer students. Admission requirements for transfer students can be found on the University Admissions website at: http://www.calstatela.edu/univ/admiss/xfer.htm

Prospective transfer students must submit an online application with the application fee of $55 via: www.CSUMentor.com

The CSUMentor website allows students to apply to any of the 23 campuses in the California State University system. Applicants must request a transcript from each college they have attended to be sent to the Office of Admissions. If students fail to provide transcripts from all colleges and/or universities they have attended by a certain deadline, they may be denied application and admittance to Cal State L.A. Deadline information for CSUMentor applications, application fee payment and transcripts can be found at: http://www.calstatela.edu/univ/admiss/deadlines/
University Procedures for Evaluating Transfer Credit

Undergraduate transfer students’ previous college work is evaluated in terms of its relevance to Cal State L.A. course offerings and degree requirements. We have been assured by the Office of Admissions that, “The business process for new and returning transcript evaluation for transfers is as follows; The transcript evaluation is completed prior to the beginning of the second term of attendance.”

This evaluation identifies general education and graduation course requirements met by transfer courses and credit to be accepted in satisfaction of unit requirements. The policies of the transfer institution(s) are followed when grade point averages of transfer course work are computed. If such policies cannot be determined, Cal State L.A. policies are followed. Established articulation agreements are followed when evaluating college transcripts.
For California Community Colleges, comparable course-to-course articulation agreements are adjudicated by the Department Chair for lower division major preparation. General Education courses from the California Community Colleges are articulated through system-wide agreements. Grades of “C minus” or higher are transferable. All comparable course articulation for any of the California Community Colleges is available at assist.org, an online student-transfer information system that indicates how course credits earned at one public California college or university can be applied when transferred to another. ASSIST.org is the official repository of articulation for California’s public colleges and universities and provides the most accurate and up-to-date information about student transfer in California.

Department Procedures for Evaluating Transfer Credit

Upon admission, evaluators in the Admissions Office post all articulated courses on student records in Golden Eagle Territory – Student Administration (GET/SA). This information can be found on the student’s Transfer Summary Credit Screen. Some of the lower division coursework that is transferable, but not articulated will appear as XFER LD (lower division transferable). Some of the most common courses for which transfer credit is considered appropriate include lower division technical coursework from automotive, drafting, CAD, electronics, graphic communications, and manufacturing programs.
Dr. Seaman, the primary advisor for the B.S. Industrial Technology program evaluates transfer credit toward the major after the University Admissions office has determined which courses are transferable. Students may transfer up to 23 semester (35 quarter) units into the major.

In order to transfer a non-articulated course from a community college, the Primary Advisor evaluates the transfer course by examining the course syllabus and course descriptions from the community college program website and online college catalog. Once the course is verified, a request is sent to the evaluator office to indicate the course articulation, which would then be reflected in the student’s transfer credit summary screen in GET SA.

23-Unit Foundation Program Block Articulation on Assist.org

Over the past fifteen plus years, the role of community college programs offering lower division technical courses and programs has impacted the recruitment of students into the B.S. Industrial Technology program, because students do not want to repeat courses they have already taken at their community college. There are 112 community colleges with over 2.6 million students in the State of California. Many of the campuses offering technical programs (architecture, automotive, computer-aided design, drafting, electronics, and manufacturing) with greater curricular specialization, larger facilities and more faculty. The normal avenue of articulating courses with community colleges involves setting up course-by-course articulations with various community college programs. In the late 1990s, efforts were made in partnership with the CSULA Office of Undergraduate Studies on campus to set up block articulations. There were several successful block articulation agreements; however, they were difficult to 1) implement into the degree audits run on the old OASIS advisement system and 2) for the Graduation Office to process student graduation checks.

With a heavy reliance on transfer students (over 80%) for enrollment, a different approach had to be taken to accommodate transfer students who normally complete their entire lower division general education program (39 semester units) and lower division coursework in a technical major (21+ semester units). The B.S. Industrial Technology program modification, which was approved by the campus in fall 2008, was designed to include a Foundation Program that allows up to 23 semester units to be transferred into the program.

Articulation agreements for the B.S. Industrial Technology program can now be set up as a block rather than course-by-course. With a block articulation, students can see how their educational goals at a community college can be transitioned to a four-year program in Industrial Technology. In addition, community college transfer counselors and teachers become more aware of a true 2+2 pathway for their students. Up to 62 units out of 120 semester units (180 quarter) can be completed prior to transfer. This involves 39 semester units of General Education and 23 semester units in their technical major (39 + 23 = 62 units).
As part of the articulation effort over the past year, the Department of Technology and the Office of Undergraduate Studies have worked together to update information related to the Industrial Technology program in Assist.org to initiate the first part of the block articulation effort for the 2012-2013 academic year.

Current efforts underway for setting up block articulations include the following community college programs:

- Mount San Antonio College
- Los Angeles Harbor College
- Los Angeles Pierce College
- Pasadena City College
- Citrus College
- Cerritos College

An Assist.org example framework is shown in Figure 7.3.1 beginning on the next page. This illustrates a block of articulated courses between Los Angeles Harbor College and California State University, Los Angeles for the Industrial Technology program.
Articulation Agreement by Major
Effective during the 12-13 Academic Year
To: CSU Los Angeles
From: Los Angeles Harbor College
Quarter
Semester

---Industrial Technology - BS---

CSULA is an impacted campus. Campus impaction requires that we give priority admission consideration to first time freshman applicants and upper division transfers from within our local area. For additional information regarding impaction please visit http://www.calstatela.edu/univ/admiss/impaction/

University Requirement:

| ENGL 102 | Composition II | (4) | ENGLISH 102 | College Reading and Composition II |

A minimum C grade is required

The Bachelor of Science degree in Industrial Technology

The Industrial Technology program prepares graduates for careers in industry and education. The Industrial Career Track emphasizes preparation for technical leadership responsibilities within a broad variety of industries including Aerospace, Communication, Manufacturing, Transportation and Utility Services. The areas of course concentration are Computer Integrated Design, InterNetworking, Graphic Communications, Manufacturing Processes and Automation and Power/Energy/Transportation. Instruction includes laboratory experiences with a project design centered approach. Graduates of programs in Industrial Technology are called "Technologists" to distinguish them from graduates of programs in Engineering. Technologists apply Management Theory and practice with technical skills to solve problems.

The Technology Education Career Track offers preparation for the Single Subject Teaching Credential (offered through the Charter College of Education) in Industrial Technology education.

Requirements for the Major (104 units)
The Bachelor of Science degree in Industrial Technology requires a total of 180 units. The lower division program may be completed at a Community College or at another four-year institution. The major requires 104 units including 23 semester units (35 quarter units) of Community College work for students who have completed a two-year Community College program in Computer Aided Design, Electronics, Manufacturing Technology, Power/Energy/Transportation, or a similar Technology-Oriented program. Freshmen students (non-transfer) are able to complete the Lower Division (35 quarter units) by taking the required foundation program.

Students who have not completed Lower Division General Education requirements at the time of entrance to Cal State L.A. Must fulfill these remaining requirements in addition to the upper division general education and major requirements.
Industrial Technology - BS (continued)

Foundation Program (35 units)
The Foundation Program may be completed at a community college or at another four-year institution. A maximum of 23 semester units (35 quarter units) of lower division CSU transferable community college work may be applied for students who have completed a two-year Community College program in Computer Aided Design, Electronics, Manufacturing Technology, Power/Energy/Transportation, or a similar Technology-Oriented program.

Each of the courses in the right column that apply to the Foundation Program will be coded to a common course number once the student has been admitted.

Questions regarding the Foundation Program can be directed to the Department of Technology at (323) 343-4572 or vseaman@calstatela.edu.

Prerequisites (8-9 units)

MATH 102 College Algebra (4) MATH 260 Introduction to Analysis/Precalculus (5)

Or

MATH 245 College Algebra (3)

Or

MATH 104A Precalculus (4) MATH 260 Introduction to Analysis/Precalculus (5)

A minimum C grade is required.

Or

PHYS 156 Physics for the 21st Century (4) PHYSICS 11 Introductory Physics (4)

Or

CHEM 151 Fundamentals of Chemistry (5)

These required courses or their equivalents must be taken as part of the General Education Program and are not counted in the units to take for the major.

Foundation Program (35 units)
The Foundation Program may be completed at a community college or at another four-year institution. A maximum of 23 semester units (35 quarter units) of lower division CSU transferable community college work may be applied for students who have completed a two-year Community College program in Computer Aided Design, Electronics, Manufacturing Technology, Power/Energy/Transportation, or a similar Technology-Oriented program.

Each of the courses in the right column that apply to the Foundation Program will be coded to a common course number once the student has been admitted.

Questions regarding the Foundation Program can be directed to the Department of Technology at (323) 343-4572 or vseaman@calstatela.edu.

END OF MAJOR
The articulation process for the Foundation Program is in progress and the Department will continue to work with additional community college programs.

7.4 Assessment of Competency Measures

Assessment measures shall exist for each of the measurable competencies identified for the program/option.

Our program utilizes both direct and indirect assessment measures that are administered by the department and the university. The assessment begins when students enter the university and continue at least until they graduate. Afterwards, we seek their input as alumni, employers, and IAB members. Examples of assessment instruments administered by the department include the ATMAE certification exam, senior exit survey, and alumni survey.

Direct Assessment Measures

Graded Student Work (Department Measures)

Industrial Technology faculty evaluate student homework, laboratory activities, and other instructional performance that address specific student learning outcomes (SLOs) in their courses. Assessment of student work is used to address deficiencies related to the course SLOs. Samples of assignments collected by the instructors will be made available to the ATMAE reviewers during the visit and will be accessible via our SharePoint server.

Locally Developed Quizzes and Exams (Department Measures)

Quizzes and examinations are used to assess student attainment of very specific knowledge-based SLOs. Instructors use the results from quizzes and exams to better understand where students in class are successful and/or deficient relative to expectation. Samples of quizzes and examinations collected by the instructors will be made available to the ATMAE reviewers during the visit.

Certification Exams (External Measures)

CISCO CCNA (CISCO Certified Network Associate) is the only certification exam available to students within the Industrial Technology program Internetworking concentration. The students are encouraged—but not required—to take the exam upon completion of four courses: one required core course and three concentration courses. Internetworking is one of five concentrations available to students within the program.

Since there is no singular certification exam available that applies to the Industrial Technology program, the faculty decided to find an exam to target the Manufacturing Processes and Automation concentration. The first course within the concentration is TECH 460 Manufacturing, Materials and Processes prerequisite of TECH 360 Modern Manufacturing.
After reviewing certification exams available from the Society of Manufacturing Engineers and ATMAE, it was determined that the department use the Certified Manufacturing Specialist exam from ATMAE for course level assessment of student learning outcomes and content as a pilot test using the exam. TECH 460 was chosen as the course for pilot testing because it involves preparing student teams to develop and manufacture a product for possible inclusion in the Manufacturing Challenge Contest held at the annual Aero Defense conference on March 19, 2013 at the Long Beach (California) Convention Center.

The student learning outcomes (SLOs) for TECH 460 include having students:

- Distinguish different type of materials and their characteristics.
- Set up and run common machine tools, such as manual lathes, mills and drill presses.
- Select proper cutting tools based upon what we have available and tool manufacturer’s recommendation.
- Recognize appropriate processes for different type of materials.
- Select and set up power tools.
- Measure parts with standard measuring tools, such as micrometers, dial calipers, and height gauge.
- Understand the value of traditional and non-traditional manufacturing processes in industry.

The course content for TECH 460 is closely aligned to the 16 content areas addressed by the CMS exam includes the following:

- Manufacturing Joining Processes
- Manufacturing Forming Processes
- Manufacturing Casting Processes
- Nontraditional Machining
- Machining
- Manufacturing Philosophies
- Polymers
- Industrial Material
- Computer Aided Manufacturing
- Quality
- Production Planning
- Wood Technology
- Metrology
- Supervision/Management
- Technical Drafting
- Electronics

Additional information and results related to the CISCO and ATMAE certification exams can be found in Section 7.17 – Student Success in Passing Certification Exams.
All Industrial Technology majors who intend to enroll in the Required Core class entitled TECH 400 Written Communication Skills for Industrial Technology must meet two university requirements before registering for the course. They must have completed English 102 Composition II with a minimum grade of “C” and pass the WPE.

As indicated in the University Catalog under Upper Division Writing Requirements, “All Cal State L.A. students who entered summer 1984 or later and are pursuing a degree or credential must satisfy the Graduation Writing Assessment Requirement (GWAR) by passing the WPE. Students must first pass ENGL 101 and 102 (or their equivalents) with a minimum grade of C prior to taking the WPE. The WPE must be taken and passed prior to completion of 135 quarter units eligible for degree completion. Transfer students who have completed 135 or more degree eligible units upon entrance must pass the WPE during their first quarter of residence at Cal State LA Students who have satisfied the upper division writing proficiency requirement at another CSU campus shall be considered to have met the Cal State LA requirement.

Students who fail to take and pass the WPE within the required time limit of 135 units will have a hold placed on their records, which will preclude them from enrolling in any courses and will be placed on administrative probation. These students will be required to take ENGL 102, UNIV 400 or UNIV 401 in their next quarter and to complete the GWAR at the earliest possible date.

Students who receive a No Credit grade on the WPE must meet with a WPE consultant in the University Writing Center to discuss deficiencies identified by the exam and receive recommendations of activities to correct these deficiencies. Based on the recommendations from the WPE consultant, students who have completed less than 135 units of degree eligible coursework may re-take the WPE or enroll in UNIV 401, the upper division writing proficiency course, while students who have completed 135 units or more of degree eligible coursework must enroll in UNIV 401, Writing Proficiency.”

Students are made aware of the English 102 and WPE requirements through new student orientation, through their enrollment in an Introduction to Higher Education course like TECH 150 Introduction to Higher Education in Technology for freshmen or TECH 301 Transition to CSULA for Technology Majors for transfer students. Students and advisors are able to monitor the progress/completion of these two requirements by running an Academic Advisement Report in GET/SA as shown below in Figure 7.4.1.
Senior Capstone Experience: Industry Practicum – TECH 495 (*Department Measures*)

All Industrial Technology majors are required to complete a senior-level capstone experience. The capstone is a one-quarter experience entitled TECH 495 Practicum in Industrial Technology.

The course description states:

Prerequisites: Senior standing and/or instructor consent. Capstone experience to demonstrate competencies already learned. Application of knowledge, skills and attitudes related to the design, production, and servicing of commercial and industrial products and devices. Lecture 2 1/2 hours, laboratory 4 1/2 hours.

Student project teams require a written report, an oral presentation, and are evaluated by members of the Industrial Advisory Board (IAB) every June during the annual Senior Design Day activities organized by the College of Engineering, Computer Science, and Technology. The inclusion of IAB members began in June of 2011 coinciding with regularly scheduled meetings of the IAB. The IAB holds an abbreviated meeting followed by the evaluation of the team presentations.

As part of the improvement process and the inclusion within the Senior Design Day for the College, a presentation evaluation instrument was obtained from the Senior Design Director in Mechanical Engineering and modified to suit the needs of TECH 495.
The presentation evaluation form was first used last year on June 8, 2012 by members of the IAB along with a question and answer session whereby all IAB members have the opportunity to provide feedback to each presentation team. The forms were collected from each of the IAB members by Dr. Paul Liu, instructor for TECH 495. A sample presentation evaluation form is shown below in Figure 7.4.2 and the results will be provided in the appendices on the SharePoint server.
Team 1: (names are inserted here)

Evaluator: _______________________________

A. Learning Outcomes
   1. Students are able to analyze the problem through research and analytical methods
   2. Students are able to define product design principles in industrial practices.
   3. Students are able to apply production control knowledge to manufacturing processes.
   4. Students are able to integrate quality system in product reliability analysis.
   5. Students are able to identify key elements in communication and teamwork environments.

B. Presentation Delivery
   6. Project problem is clearly identified.
   7. The organization of the presentation is easy to follow.
   8. The preparation is adequate.
   9. The presenters have captured the attention of the audience.
   10. The visual/audio materials are sufficient.

What did you like about the presentation?

What can be improved?
Indirect Assessment Measures

Department of Technology Program Review Process (University Measures)

University Program Review occurs on a six-year cycle (Figure 7.4.3). The starting point (Year 1) is the year the program composes the self-study and five-year plan. The schedule for review for the Department of Technology will occur for 2013-2014; note that the years listed below corresponds to the year two external and internal reviews of the Program Review Cycle, and that the self study and five-year plan are to be completed prior to that listed in the schedule.

![Program Review Cycle Diagram](Diagram)

Figure 7.4.3. - CSULA Program Review Cycle
Annual Reports on Program Improvement *(University Measures)*

Each year as part of the Program Review process, the Division of Academic Affairs requires departments to submit an Annual Report on Program Improvement. The annual report is divided into three parts:

Part I  Assessment Inventory – question areas

1. Are program level SLOs mapped to the curriculum?
2. Are program level SLOs aligned with accreditation standards or requirements?
3. Provide a rough estimate of the percent of courses in the program for which there are course objectives.
4. Other than GPA, what data/evidence is being used to demonstrate that graduates have achieved stated SLOs for the degree?
5. Who uses the data/evidence about student performance collected by your program?
6. How are the findings used?
7. How are the findings disseminated?
8. Does the program have an assessment schedule in place to collect data for all the SLOs in one cycle of program review?
9. What types of technology do you use for collecting and analyzing data on your SLOs?
10. Would faculty from your program be willing to share their expertise about assessing SLOs?
11. Would faculty from your program be interested in professional development in assessment practices?

Part II  Achievement of Student Learning Outcomes

1. Outcomes Assessment Update
2. Action Plan Items

Part III  Alignment of Institutional Learning Outcomes and Program Student Learning Outcomes.

This section requires programs to align Program Learning Outcomes to Cal State L.A.’s Institutional Learning Outcomes (ILOs)

Copies of the Annual Reports on Program Improvement for the Industrial Technology program will be made available to the ATMAE Review Team on the SharePoint server.
Quarterly Student Opinion Surveys *(University measures)*

Near the end of each quarter of instruction, the Student Opinion Survey of instruction is administered to every student during the ninth or tenth week. The policy related to the administration of the Student Opinion Survey can be found online in [Appendix L](#) of the Faculty Handbook. The survey questions are shown in Table 7.4.1. The survey consists of two parts. Part A offers 11 standard questions with a scale. Part B of the Student Opinion Survey allows students to provide written feedback. Comments related to course content, method of presentation, materials, assignments, and or any other area of instructional performance are encouraged.

**Table 7.4.1 Student Opinion Survey Standard Questions**

<table>
<thead>
<tr>
<th>Part A: Student Opinion Survey</th>
<th>Strongly Agree</th>
<th>Somewhat Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Don’t Know N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The course syllabus clearly stated course objectives, requirements and grading criteria.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. The reading and other assignments contributed to my understanding of the subject.</td>
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</tr>
<tr>
<td>3. Exams, projects, papers, etc. were good measures of the course material.</td>
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<tr>
<td>4. The instructor provided timely feedback about my performance in class.</td>
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<tr>
<td>5. The instructor clearly presented the subject matter.</td>
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<tr>
<td>6. The instructor was well prepared.</td>
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<tr>
<td>7. The instructor demonstrated knowledge of the subject matter.</td>
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<tr>
<td>8. The instructor was accessible to provide requested help in the subject.</td>
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<tr>
<td>9. The instructor was respectful and unbiased when interacting with students.</td>
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</tr>
<tr>
<td>10. The course contributed to my intellectual growth and/or helped me develop useful skills.</td>
<td></td>
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</tr>
<tr>
<td>11. Overall, the instructor was an effective teacher.</td>
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<td></td>
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</tr>
</tbody>
</table>

Part B: Students, please give us your comments (below) related to course content, method of presentation, materials, assignments, and or any other area of instructional performance. Use the back of this sheet if necessary.
All students in the class fill out the survey while the faculty member is out of the room. They are aware that the faculty member teaching their class will receive the anonymous results after grades have been posted for the quarter. At the beginning of the following quarter, the Department of Technology receives all Student Opinion Surveys which are reviewed by the Chair of the Department and, if needed, discussed with the individual faculty. The original surveys then are returned along with the departmental means for that quarter allowing each faculty member to review their results for each of the eleven (11) questions in Part A and the individual student comments provided in Part B.

The results are used by individual faculty to improve their courses and instructional methods and by tenure-track faculty who are progressing through the annual Retention, Tenure and Promotion process.

**Senior Survey (Department Measures)**

Beginning in 2011/2012 as part of our Assessment Plan a Senior Survey process was initiated. The process involves each student who applies for a Graduation Check (as part of the application process for graduation) meeting with their advisor. After completing the paperwork for the graduation check and looking over their remaining requirements, students are asked to take an anonymous online survey to provide feedback to be used to help improve the program. Students were grouped according to their graduation year. The first group included those students who applied for graduation targeting a 2012 completion (winter, spring, summer, fall quarters) and the second group included those students who applied for 2013 completion (winter, spring quarters).

The Senior Survey was developed and delivered on the Department of Computer Science’s CSNetwork Services website. The 2013 survey taken by graduating seniors for the Industrial Technology program can be accessed online at the following location:

http://csns.calstatela.edu/department/tech/survey/current

The survey consists of two sections with information about the survey for the student and the advisor explaining the survey to the student during the graduation application/advisement meeting. The front end of the survey states:
2013 Survey of Graduating Seniors
B.S. Industrial Technology program

The purpose of this survey is to help faculty continuously improve the Industrial Technology (ITEC BS) program. Graduating seniors have gained many insights into the strengths of the program and areas where the program might be improved.

Reminder to advisors:

- Only senior students who apply for a Graduation Check in 2013 take this survey!

Section I

INSTRUCTIONS:

There are two sections to this survey. There are 25 items in Section I and 19 items in Section II.

Questions 1 - 17 - please select the response that best captures your experience in the Industrial Technology program.

1 = Strongly Disagree
2 = Disagree
3 = Somewhat Agree/Disagree
4 = Agree
5 = Strongly Agree

Questions 18 - 25 - these questions provide the opportunity for personal feedback and the option to include information to assist us with surveying employers.

After completing Section I, you will be required to complete Section II and provide your input on 19 Student Learning Outcomes related to the Industrial Technology program.

Note: This online survey is represented below in a different format.
### Section I:
2013 Survey of Graduating Seniors B.S. Industrial Technology Program

<table>
<thead>
<tr>
<th></th>
<th>5 Extremely Satisfied</th>
<th>4 Satisfied</th>
<th>3 Somewhat Satisfied</th>
<th>2 Unsatisfied</th>
<th>1 Very Unsatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Faculty were helpful when I needed assistance.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Overall, the quality of instruction was excellent in TECH courses.</td>
<td></td>
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<tr>
<td>3. I was treated fairly in my dealings with faculty.</td>
<td></td>
<td></td>
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<tr>
<td>4. Faculty were experts in their subject matter areas.</td>
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<td></td>
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<tr>
<td>5. The College (ECST) computer resources met my needs.</td>
<td></td>
<td></td>
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<tr>
<td>6. Overall, I am satisfied with the quality of laboratory equipment.</td>
<td></td>
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<tr>
<td>7. Lab hours provided access to equipment to complete assignments.</td>
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<tr>
<td>8. I was able to get into TECH courses in a timely manner.</td>
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</tr>
<tr>
<td>9. I am satisfied with the help provided by the academic advisor(s).</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10. My peers were helpful and contributed to my learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11. I felt comfortable interacting with faculty in my program.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12. Being in the Industrial Technology program gave me a sense of belonging on the campus. It made me feel a part of the University.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>13. My career options have greatly expanded.</td>
<td></td>
<td></td>
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<tr>
<td>14. The content of TECH courses was state-of-the-art.</td>
<td></td>
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</tr>
<tr>
<td>15. Overall, I learned a great deal in my TECH classes.</td>
<td></td>
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<tr>
<td>16. I would recommend the Industrial Technology program to others.</td>
<td></td>
<td></td>
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<tr>
<td>17. The campus library services were adequate.</td>
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<td></td>
</tr>
</tbody>
</table>

18. Who or what influenced you in deciding to pursue the Industrial Technology program at CSULA?

19. Additional comments about your experiences with the Industrial Technology program at CSULA?

20. I am a student member of one of the following student organizations in the College of ECST.

- [ ] Society of Automotive Engineers
- [ ] Society of Manufacturing Engineers
- [ ] Technology Education Collegiate Association
- [ ] None

21. I was able to Intern/Co-op at a company while enrolled in the Industrial Technology program | [ ] Yes | [ ] No |

22. I am/will be using the services of the CSULA Career Development Center in my job search process. | [ ] Yes | [ ] No |

23. Have you secured a permanent position in your field? | [ ] Yes | [ ] Tentative | [ ] Interviewing | [ ] Internship | [ ] No 

Optional information ONLY used for confidential employer follow-up survey – thank you!

24. a. Name:  

b. Your permanent email address:

25. If you marked YES above, please indicate the name and address of your employer and the name of your immediate supervisor (Optional Information ONLY used for Employer follow-up survey):
Section II

Section II of the Senior Survey asks the question: How satisfied are you that Cal State L.A. is providing you the following as related to 19 Student Learning Outcomes? Please select the response that best captures your experience in the Industrial Technology program.

Note: if you think the item is Not Applicable (does not apply to you), then do not select any of the choices and simply go on to the next item.

<table>
<thead>
<tr>
<th></th>
<th>Knowledge of science, math and technical management.</th>
<th></th>
<th>5 Extremely Satisfied</th>
<th>4 Satisfied</th>
<th>3 Somewhat Satisfied</th>
<th>2 Unsatisfied</th>
<th>1 Very Unsatisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of science, math and technical management.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Knowledge of the role of technical management.</td>
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<tr>
<td>3</td>
<td>Knowledge of systems and the integration of technologies.</td>
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<tr>
<td>4</td>
<td>Knowledge of information technology including its use in a digital enterprise.</td>
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<tr>
<td>5</td>
<td>Knowledge of contemporary technology/management issues.</td>
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<tr>
<td>6</td>
<td>Ability to apply theories and principles to solve technical and management related problems</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>Ability to design, test and analyze a system or process to meet desired needs.</td>
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<tr>
<td>8</td>
<td>Written, oral communication and presentation skills.</td>
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<tr>
<td>9</td>
<td>Ability to exhibit supervisory and team leadership skills.</td>
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<tr>
<td>10</td>
<td>Ability to collect, analyze and interpret data.</td>
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<tr>
<td>11</td>
<td>Ability to collaborate within a digital enterprise with a multi-disciplinary project team.</td>
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<tr>
<td>12</td>
<td>Ability to select and use computer applications software associated with desired needs.</td>
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<tr>
<td>13</td>
<td>Understand ethical responsibility.</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>Exhibit professionalism in my area of expertise.</td>
<td></td>
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<tr>
<td>15</td>
<td>Recognize need for, and an ability to engage in life-long learning.</td>
<td></td>
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<tr>
<td>16</td>
<td>Desire to stay current on issues.</td>
<td></td>
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<tr>
<td>17</td>
<td>Desire to achieve a balance of workplace and personal goals.</td>
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<tr>
<td>18</td>
<td>Desire to adopt emerging technologies to improve my area of expertise.</td>
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<tr>
<td>19</td>
<td>Desire to support and promote the goals of my organization.</td>
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</tbody>
</table>
Alumni Survey (Department Measures)

The last time a survey of graduates of the program occurred was for the 2006 Program Review Process (two years prior to the new program modification that became effective fall 2008). To prepare for the ATMAE Accreditation effort and for the Program Review process slated for the following year a survey instrument was developed to gain valuable feedback from our alumni who graduated from 2007 to 2011. The Alumni Survey was developed and reviewed by faculty and members of the Industrial Advisory Board. The survey was delivered via Survey Monkey to 104 graduates of our program via email during the fall quarter of 2012 and winter quarter 2013.

The three sections of the Alumni Survey instrument are presented in Appendices on the SharePoint server, and results are discussed in the following sections of the self-study document:

- 7.13 – Employment of Graduates
- 7.14 – Job Advancement of Graduates
- 7.16 – Graduate Success in Advanced Programs

### 7.5 Program Structure and Course Sequencing

ToC

Each program/option shall meet minimum* foundation semester hour requirements. Programs/options may exceed maximum foundation semester hour requirements specified in each area, but appropriate justification must be provided. A specific list of courses and credit hours that are being counted toward each category shall be included in the Self Study Report (please use the attached table 7.5). Minimum and maximum foundation semester-hour requirements are listed below for degree programs/options:

The B.S. Industrial Technology degree approved in 2008 is a 120 semester equivalent (180 quarter unit) program with coursework meeting the minimum/maximum foundation requirements as shown in Table 7.5.1. Our program complies with this standard.

b. **Bachelor Degree:** Programs/options shall be a minimum of 120 semester hours and shall meet the following minimum/maximum foundation semester-hour requirements:

<table>
<thead>
<tr>
<th>Course Area</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Education (must include oral and written communications)</td>
<td>18-36</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>6-18</td>
<td></td>
</tr>
<tr>
<td>Physical Sciences*</td>
<td>6-18</td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>12-24</td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>24-36</td>
<td></td>
</tr>
<tr>
<td>Electives</td>
<td>0-18</td>
<td></td>
</tr>
</tbody>
</table>

*Life Sciences may be appropriate for selected programs of study.

Students must successfully complete a minimum of 15 semester hours of junior or senior level major courses at the institution seeking accreditation.
Appropriate laboratory activities shall be included in the program/option and a reasonable balance shall be maintained between the practical application of “how” and the conceptual application of “why.”

There shall be evidence of appropriate sequencing of courses in each program/option to ensure that applications of mathematics, science, written and oral communications are covered in technical and management courses. Examples of graded student work and textbooks for each management and/or technical course shall be provided for the visiting team. Further, sequencing will ensure that advanced level courses build upon concepts covered in beginning level courses.

Table 7.5.1 below identifies the courses that satisfy the bachelor degree requirements. The only requirement area that exceeds ATMAE’s requirements is General Education. The requirement is exceeded by four semester units. General Education requirements are set by the University and CSU requirements and we are not permitted to change this campus requirement.
### Table 7.5.1 - Bachelor Degree Foundation Semester Hour Requirements Table

<table>
<thead>
<tr>
<th>Requirements</th>
<th>SEMESTER HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Education</strong> (Humanities, English, History, Sociology, Psychology, Speech, etc.) 18-36 Semester Hours</td>
<td></td>
</tr>
<tr>
<td>CSULA General Education Program – <a href="#">Click Here</a></td>
<td></td>
</tr>
<tr>
<td>Subtracted Math 102 &amp; Phys 156 and U.D. Theme (Natural Science)</td>
<td></td>
</tr>
<tr>
<td>2.67 x 3 = 8.01</td>
<td></td>
</tr>
<tr>
<td>72 quarter units = 48 sem – 8.01 =</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>40.00</td>
</tr>
<tr>
<td><strong>Mathematics</strong> 6-18 Semester Hours</td>
<td></td>
</tr>
<tr>
<td>Math102 College Algebra or Math 104A PreCalc</td>
<td>2.67</td>
</tr>
<tr>
<td>Math 242 Math for Business &amp; Econ Majors</td>
<td>2.67</td>
</tr>
<tr>
<td>Econ 209 Applied Business &amp; Econ Statistics I</td>
<td>2.67</td>
</tr>
<tr>
<td>Econ 309 Applied Business &amp; Econ Statistics II</td>
<td>2.67</td>
</tr>
<tr>
<td>Acct 202 Survey of Accounting</td>
<td>2.67</td>
</tr>
<tr>
<td>Total</td>
<td>13.35</td>
</tr>
<tr>
<td><strong>Physical Sciences</strong> 6-18 Semester Hours</td>
<td></td>
</tr>
<tr>
<td>G.E. B1 - Bio 155 or Bio 156 or Micr 151</td>
<td>2.67</td>
</tr>
<tr>
<td>G.E. B2 – Phys 156 (4 qrt) or Chem 151 (5 qtr)</td>
<td>2.67</td>
</tr>
<tr>
<td>G.E. B3 – Applied Natural</td>
<td>2.67</td>
</tr>
<tr>
<td>Natural Sciences block – Upper Division G.E. Theme</td>
<td>2.67</td>
</tr>
<tr>
<td>Total</td>
<td>10.68</td>
</tr>
<tr>
<td><strong>Management</strong> 12-24 Semester Hours</td>
<td></td>
</tr>
<tr>
<td>Tech 101 Industrial Safety for Industrial Ed.</td>
<td>2</td>
</tr>
<tr>
<td>Tech 310 The Design Process</td>
<td>2</td>
</tr>
<tr>
<td>Tech 360 Modern Manufacturing</td>
<td>2</td>
</tr>
<tr>
<td>Tech 482 Metrics for Industry</td>
<td>2</td>
</tr>
<tr>
<td>Tech 400 Written Communication Skills for Ind. Tech</td>
<td>2.67</td>
</tr>
<tr>
<td>Tech 489 Industrial Training Methods</td>
<td>2.67</td>
</tr>
<tr>
<td>Tech 495 Practicum in Industrial Technology</td>
<td>2.67</td>
</tr>
<tr>
<td>Mgmt 306 Production Operations Management</td>
<td>2.67</td>
</tr>
<tr>
<td>Total</td>
<td>18.68</td>
</tr>
<tr>
<td>Requirements</td>
<td>Technical 24-36</td>
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<tr>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Tech 100 Intro to Automotive Mechanisms</td>
</tr>
<tr>
<td></td>
<td>Tech 110 Intro to Drafting</td>
</tr>
<tr>
<td></td>
<td>Tech 120 Intro to DC Electronics</td>
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<tr>
<td></td>
<td>Tech 130 Intro to Graphic Communications</td>
</tr>
<tr>
<td></td>
<td>Tech 144 Intro to Industrial Design</td>
</tr>
<tr>
<td></td>
<td>Tech 160 Intro to Metalworking</td>
</tr>
<tr>
<td></td>
<td>Tech 234 Photo Offset Lithography</td>
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<td></td>
<td>Art 287 Introduction to Photography</td>
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<td></td>
<td>Tech 291 Computers in Technology</td>
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<tr>
<td></td>
<td>Tech 305 Information Literacy</td>
</tr>
<tr>
<td></td>
<td>Tech 330 Graphic Comm Processes and Materials</td>
</tr>
<tr>
<td></td>
<td>Tech 370 Power, Energy &amp; Transportation</td>
</tr>
<tr>
<td></td>
<td>Tech 400 Written Comm Skills for Ind. Tech</td>
</tr>
<tr>
<td></td>
<td>Tech 421 Internetworking</td>
</tr>
<tr>
<td></td>
<td>Tech 488 Fluid Power</td>
</tr>
<tr>
<td></td>
<td><strong>SAMPLE CONCENTRATION = 8 Semester</strong></td>
</tr>
<tr>
<td></td>
<td>Tech 313 Product Design &amp; Development</td>
</tr>
<tr>
<td></td>
<td>Tech 315 Project Design &amp; Document Ctrl</td>
</tr>
<tr>
<td></td>
<td>Tech 411 Tool Design</td>
</tr>
<tr>
<td></td>
<td>Tech 462 Digital Manufacturing</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td></td>
<td>Tech 150 or Tech 301 Intro to Higher Ed req</td>
</tr>
<tr>
<td></td>
<td>Tech 200 History of Technology</td>
</tr>
<tr>
<td></td>
<td>Engl 102 Composition II (not a G.E. req.)</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ATMAE Minimum Total 120 Semester Hours</th>
<th>Degree Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>120</strong></td>
<td><strong>120</strong></td>
</tr>
</tbody>
</table>
Appropriate Laboratory Activities and Balance of Lecture vs. Lab

The unique characteristic of the Industrial Technology is that lecture and a laboratory experience go hand-in-hand when delivering instruction. We truly believe student learning improves with a hands-on approach. Many classes within the structure of the Industrial Technology program integrate a laboratory experience with lecture as shown in Table 7.5.2. We believe we have an appropriate balance of lecture and lab experiences within the program.
Table 7.5.2 - Lecture vs. Lab Units for TECH Classes in the Major

<table>
<thead>
<tr>
<th>Course No.</th>
<th>Course Title</th>
<th>Lecture</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation Program (35 units)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCT 202</td>
<td>Survey of Accounting</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 100</td>
<td>Introduction to Auto Mechanisms</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 110</td>
<td>Introduction to Drafting</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 120</td>
<td>DC Electronics</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 130</td>
<td>Introduction to Graphic Communication</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 144</td>
<td>Introduction to Industrial Design</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 160</td>
<td>Introduction to Metalworking</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 200</td>
<td>History of Technology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TECH 234</td>
<td>Photo Offset Lithography</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>ART 287</td>
<td>Introduction to Photography</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>TECH 291</td>
<td>Computers in Technology</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Prerequisite (8-9 units)</strong></td>
<td></td>
<td></td>
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<tr>
<td>MATH 104A</td>
<td>Pre-Calculus</td>
<td>4</td>
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</tr>
<tr>
<td>PHYS 156</td>
<td>Physics for the 21st Century -or-</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>CHEM 151</td>
<td>Fundamentals of Chemistry</td>
<td>3</td>
<td>3.0</td>
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<tr>
<td><strong>Required Core (38 units)</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>TECH 101</td>
<td>Industrial Safety for Industrial Education</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TECH 150</td>
<td>Introduction to Higher Education in Tech -or-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>TECH 301</td>
<td>Transition to Cal State LA for Technology Majors</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>TECH 305</td>
<td>Information Literacy for Technologists</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>TECH 310</td>
<td>The Design Process</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 330</td>
<td>Graphic Communication Processes and Materials</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 360</td>
<td>Modern Manufacturing</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 370</td>
<td>Power, Energy &amp; Transportation</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 400</td>
<td>Written Communication Skills for Indus Tech</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 421</td>
<td>Internetworking Technology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 488</td>
<td>Fluid Power</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>TECH 489</td>
<td>Industrial Training Methods</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 495</td>
<td>Practicum in Indus Technology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Course No.</td>
<td>Course Title</td>
<td>Units</td>
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</tr>
<tr>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Required Track Courses (19 units) Students must choose 1 of the 2 tracks listed below.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Track I Industry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECON 209</td>
<td>Applied Bus &amp; Econ Statistics I</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ECON 309</td>
<td>Applied Bus &amp; Econ Statistics II</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 242</td>
<td>Math for Bus &amp; Econ Majors</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MGMT 306</td>
<td>Production &amp; Operations Management</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 482</td>
<td>Metrics for Industry</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Track II Technology Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECH 384</td>
<td>Foundations of Technology Education</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 491</td>
<td>Technology Education in the Middle Grades</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 492</td>
<td>Technology Education in the High Schools</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 493</td>
<td>Technology Education Facilities: Planning, Construction, Equipment, and Maintenance</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TECH 494</td>
<td>Industrial Technology Education Curriculum</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Required Concentration Courses (12 units)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Students must complete 1 of 5 concentration areas listed below.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>1. Computer Integrated Design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECH 313</td>
<td>Product Design and Development</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 315</td>
<td>Project Design &amp; Document Control</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 411</td>
<td>Tool Design</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 462</td>
<td>Digital Manufacturing</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>2. Internetworking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECH 422</td>
<td>Router Configurations</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 423</td>
<td>Intermediate Routing and LAN Switching</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>TECH 424</td>
<td>Wide Area Networks</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>3. Graphic Communications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TECH 432</td>
<td>Typographical Layout and Design</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 434A</td>
<td>Graphic Communication Production Management I</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 436</td>
<td>Electronic Publishing Tech and Management</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>TECH 437</td>
<td>Alternative Media Production</td>
<td>1.5</td>
<td></td>
</tr>
</tbody>
</table>
The Industrial Technology program curriculum provides students with basic knowledge, training, discipline, and skills, as defined by the Educational Objectives (Knowledge, Skills, and Attitudes) and 19 Program Outcomes.

The lower division required courses, TECH 100 and TECH 200 level, the curriculum provides students with the basic foundation program technical coursework.

The upper division required core courses, TECH 300 and TECH 400 level; the curriculum provides all majors with breadth to prepare them to choose from one of five concentrations. In each of the five concentrations, students gain additional breadth and/or depth in with the selection of courses in the concentration.

In the capstone course, TECH 495 Practicum in Industrial Technology, students demonstrate their abilities to apply the knowledge and skills they acquired. The curriculum is thus consistent with the defined Program Educational Objectives and Student Learning Outcomes.
Applications of Mathematics, Science, Written and Oral Communications

The B.S. Industrial Technology program has an adequate number of classes with applications in mathematics, science, written communication and oral communication. The examples shown below are representative, but not all inclusive. The 12 units of Upper Division General Education theme require a writing component in each of the three courses.

Examples:

**MATH 104A  Pre-calculus: Algebra**
— requires the use of mathematical skills
Prerequisite: Score of 50 or more on (or exemption from) ELM or MATH 091 with a minimum C grade or satisfactory score on placement examination. Functions, Exponential and logarithmic functions; polynomials and rational functions; systems of linear equations and matrices; sequences and series including arithmetic and geometric series.

**MATH 242  Mathematics for Business and Econ Majors**
— requires the use of mathematical skills
Prerequisites: MATH 104A with minimum C grade or satisfactory score on placement examination. Differential calculus with applications in business and Economics; introduction to integral calculus.

**ACCT 202  Survey of Accounting**
— requires the use of mathematical skills
Fundamentals of accounting theory and practice; how accounting serves the individual, the business entity, and the broader disciplines of law, government, and economics. Differential calculus with applications in business and Economics; introduction to integral calculus.

**ECON 209  Applied Business and Economic Statistics I**
— requires the use of mathematical skills
Prerequisite: MATH 091 or satisfactory score on mathematics placement examination. Elementary business and economics statistics with computer applications; descriptive statistics, frequency distribution, probability, sampling distribution, estimation, and significance tests. Some sections may be technologically mediated.

**ECON 309  Applied Business and Economic Statistics II**
— requires the use of mathematical skills
Prerequisites: ECON 209 and MATH 102 or MATH 104A. Data analysis using spreadsheet software: sampling, testing and statistical inference; study of relationships between variables within business contexts; regression, correlation and time-series analyses with business applications including forecasting. Some sections may be technologically mediated.

**TECH 110  Introduction to Drafting**
— requires the use of mathematical and visual communication skills
Application of theory and fundamentals of drafting: orthographic projection techniques applied for a basic understanding of architectural, machine, forging, casting, welding, and electronic drafting. Lecture 1 1/2 hours, laboratory 4 1/2 hours.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TECH 120</td>
<td><strong>DC Electronics Drafting</strong></td>
<td>-</td>
<td>Requires the use of mathematical skills. DC circuits; hands-on experiences in using VOM and DVM for basic electrical measurement and troubleshooting. Lecture 1 1/2 hours, laboratory 4 1/2 hours.</td>
</tr>
<tr>
<td>TECH 160</td>
<td><strong>Introduction to Metalworking Drafting</strong></td>
<td>-</td>
<td>Requires the use of mathematical skills. Basic metal properties, metalworking processes, and hand and machine tool applications. Lecture 1 1/2 hours, laboratory 4 1/2 hours.</td>
</tr>
<tr>
<td>PHYS 156</td>
<td><strong>Physics for the Twenty-first Century</strong></td>
<td>-</td>
<td>Requires the use of science skills. Current topics in physics that will play a significant role in social and economic issues of the 21st century. Fundamental physics concepts necessary to understand these topics. Lecture 3 hours, laboratory 3 hours.</td>
</tr>
<tr>
<td>CHEM 151</td>
<td><strong>Fundamentals of Chemistry I</strong></td>
<td>-</td>
<td>Requires the use of science skills. Prerequisites: One year of high school algebra, satisfactory performance on mathematics placement examination given during registration period. Introductory course in fundamental laws and theories of general chemistry. Lecture 3 hours, recitation 1 hour, laboratory 3 hours. No credit toward Chemistry or Physics major.</td>
</tr>
<tr>
<td>TECH 360</td>
<td><strong>Modern Manufacturing</strong></td>
<td>-</td>
<td>Requires the use of mathematical skills. Introduction to the practices and procedures used in modern manufacturing to bring a product to market. Review of industrial materials, processes, standards, safety, quality, and computer software used in manufacturing. Lecture 1 1/2 hours, laboratory 4 1/2 hours.</td>
</tr>
<tr>
<td>TECH 370</td>
<td><strong>Power, Energy and Transportation</strong></td>
<td>-</td>
<td>Requires the use of mathematical skills. Power energy and transportation concepts: available energy sources, power conversion process, power transmission methods and land, sea, air, and space transportation systems. Lecture 1 1/2 hours, laboratory 4 1/2 hours.</td>
</tr>
<tr>
<td>ENGL 101</td>
<td><strong>Composition I</strong></td>
<td>-</td>
<td>Requires the use of written communication skills. Composition I: Reflective and Expository Writing Prerequisite: English Placement Test or completion of ENGL 096. Reading and writing to develop and communicate ideas. Instruction in basic strategies for planning, composing, and revising college writing. Use of authorities, examples, arguments and facts.</td>
</tr>
<tr>
<td>ENGL 102</td>
<td><strong>Composition II</strong></td>
<td>-</td>
<td>Requires the use of written communication skills. Prerequisite: ENGL 101 or equivalent. Continuing to practice the rhetorical skills introduced in ENGL 101, students will develop analytical, interpretive, and information literacy skills necessary for constructing a well-supported, researched, academic argument. Graded A, B, CINC. *ENGL 102 or its equivalent is prerequisite to all English courses with higher numbers. Students subject to catalogs prior to 1993-95 satisfy the prerequisite with ENGL 101 or 190.</td>
</tr>
</tbody>
</table>
COMM 150  **Oral Communication**
— requires the use of oral communication skills

Introduction to effective oral communication through study and experience in analysis, synthesis, and presentation of informative and persuasive discourse in a public speaking forum.

TECH 400  **Written Communication Skills for Industrial Technology**
— requires the use of written communication skills

Prerequisites: ENGL 102 and UNIV 400. Written communication skills for the professional needs of Industrial Technology students with emphasis on education, public, industrial, business education and public sector requirements.

TECH 488  **Fluid Power**
— requires the use of mathematics and physics skills

Prerequisite: PHYS 156. Application of principles of industrial hydraulic and pneumatic circuits; emphasis on basic laws and operation of pressure, directional control valves, and actuators as they apply to manual and automated circuits. Lecture 1 1/2 hours, laboratory 4 1/2 hours.

TECH 489  **Industrial Training Methods**
— requires the use of written and oral communication skills

Training approaches for industrial/technical management personnel; overview of design and management of the training function in the modern work world, instructional design, and delivery systems.

TECH 495  **Practicum in Industrial Technology**
— requires the use of written and oral communication skills

Prerequisites: Senior standing and/or instructor consent. Capstone experience to demonstrate competencies already learned. Application of knowledge, skills and attitudes related to the design, production, and servicing of commercial and industrial products and devices. Lecture 2 1/2 hours, laboratory 4 1/2 hours.

MGMT 306  **Operations Management II**
— requires the use of mathematical skills

Prerequisites: ECON 209. Management of the operations function of manufacturing and service firms including operations strategy, forecasting, process design and improvement, production and inventory management, supply-chain management, capacity planning and management, and quality assurance.

**Sequencing to Ensure Advanced Level courses Build upon Concepts**

In the advanced level courses students have a choice of five concentration areas in the Industrial Technology program:

1. Computer-Integrated Design
2. Internetworking
3. Graphic Communications
4. Manufacturing Processes and Automation
5. Power, Energy, and Transportation

Industrial Technology majors take all five gatekeeper courses in the core to give them breadth, as follows:
TECH 310  The Design Process (3)
Analysis and application of the methods, models, organizations, standard and practices used in the design of projects or products. Lecture 1 1/2 hours, laboratory 4 1/2 hours.

TECH 421  Internetworking Technology (4)
Computer networking in LAN and WAN, OSI model, TCP/IP, data encapsulation, LAN devices, network media, cable testing, structured cabling, Ethernet technology, layer 2 switching, IP addressing, subnetting, and routing.

TECH 330  Graphic Communications Processes and Materials (3)
Junior standing in Graphic Communications, Production Technology, or consent of instructor based upon previous experience. Examination, application, and control of processes used in the graphic communications industry including prepress, press, post-press operations, major printing processes, electronic publishing, and new media production. Nature and control of materials used in graphic communications reproduction processes with emphasis on ink on paper relationships.

TECH 360  Manufacturing, Materials, and Processes (3)
Introduction to the practices and procedures used in modern manufacturing to bring a product to market. Review of industrial materials, processes, standards, safety, quality, and computer software used in manufacturing.

TECH 370  Power, Energy and Transportation (3)
Power energy and transportation concepts: available energy sources, power conversion process, power transmission methods and land, sea, air, and space transportation systems.

7.6 Student Admission and Retention Standards

There shall be evidence showing that the quality of technology, management, and applied engineering students is comparable to the quality of students enrolled in other majors at the institution. The standards for admission and retention of technology, management, and applied engineering students shall compare favorably with institutional standards. Sources of admission information may include test scores and grade rankings. Sources of retention information shall include general grade point averages of technology, management, and applied engineering students compared to programs in other institutional programs.

Prospective students in the Industrial Technology program are admitted to the program according to the same admission standards for all undergraduate students within the CSU. Admission and retention standards along with retention services provided by the University and the College are discussed below. Finally a comparison of GPA information between Industrial Technology, ECST students and the University as a whole is provided.

Student Admission Standards
CSUMentor [http://www.csumentor.com](http://www.csumentor.com) (Figure 7.6.1) is an online resource designed to help students and their families learn about the CSU system, select a CSU campus to attend, plan to finance higher education, and apply for admission.

![Figure 7.6.1 – CSUMentor.com home page](image)

California State University, like all other colleges in the California State system, requires each student to complete a set of college-preparatory coursework with a grade of C or better prior to admission. This curriculum includes four years of English, three years of mathematics, two years each of social science, lab science, and foreign language, and one year each of arts and electives. And like other Cal State Universities, Cal State L.A. uses the “eligibility index” to determine an applicant’s eligibility for admission.

The index is a combination of the applicant’s high school grade point average and their ACT or SAT standardized test score. Students with good performances in honors courses get bonus points toward their index. To calculate the index, there are two different formulas: either multiply the applicant’s high school grade point average by 800 and add the total SAT score, or multiply the applicant’s high school grade point average and add ten times the total ACT score.

For California residents, the SAT index requirement is 2900, and the ACT index is 694. For nonresidents, the requirement is an index of 3502 (SAT) or 842 (ACT). California residents with a high school grade point average of more than 3.0 are not required to submit test scores, and the same rule applies to out-of-state applicants with a high school grade point average of 3.61 or more. However, Cal State L.A. urges all students, regardless of grade point average, to take one of the two exams.
Cal State LA has an open admissions deadline, and prospective applicants should check with the school to see if applications are still being accepted for the term they desire to enroll. The application fee is $55. Applications can be submitted on-line. Students who are enrolled in high school at the time of application will need to have their official final high school transcripts sent after graduation to the Admissions Office.

As part of their application, students should submit high school transcripts and ACT or SAT test scores. To be admitted, students will need to satisfy the California State requirements: 4 units of English, 3 units of mathematics, 2 units of history and social studies, 2 units of science, 2 units of a foreign language, 1 year of visual or performing arts, and 1 year of electives. Students must have a GPA of 2.0 or better in these courses. Eligibility for admission is determined by a combination of test scores and GPA.

Transfer students and international students will have varying requirements depending upon their prior educational background.

The CSULA Office of Admissions and Outreach has the responsibility of enforcing the University’s policies for the acceptance of transfer students. The Admissions Office ensures that transfer students will meet the California State University requirements for admission.

An undergraduate transfer applicant qualifies for admission as a transfer student if s/he has a C (2.0) grade point average or better in all transferable units attempted, is in good standing at the last college or university attended, and meets any of the following standards:

- Meets the freshman admission requirements in effect for the term to which s/he is applying (see section entitled “First-Time Freshman Applicants” in the 2011-2014 University Catalog).
- Was eligible as a freshman at the time of high school graduation and has been in continuous attendance at an accredited college since high school graduation.
- Was eligible as a freshman at the time of high school graduation except for the subject requirements, has made up the missing subjects, and has been in continuous attendance in an accredited college since high school graduation.
- Has completed at least 84 transferable quarter (56 semester) units and has made up any missing subject requirements. Nonresidents must have a 2.4 grade point average or better.

Students are continuously evaluated from the time they apply for admission to the University until they graduate. These evaluations occur in every situation in which a student must attain a satisfactory (“passing”) result to progress toward graduation. Each evaluation plays a role in ensuring that the educational objectives for the Industrial Technology program are achieved, i.e., that graduates of the Industrial Technology program have the knowledge, skills, and attitudes required for a successful career related to their major.
The first evaluation occurs when the University Admissions Office reviews a student’s academic record, and, based on System wide standards, the student is either granted or denied admission to the University. For high school students, this evaluation is based on an Eligibility Index that combines high school GPA and SAT scores. For transfer students, the evaluation is based on grades achieved in work at prior institutions.

Once students are admitted, all non-exempt students are required to take the Entry-Level Mathematics Exam and the English Placement Test. These diagnostic evaluations are used to place students in appropriate levels of mathematics and English coursework. Students may also be required to undergo further diagnostic evaluations in mathematics and chemistry before they can register for courses in these disciplines that are required for the major.

For transfer students, the University Admissions Office assumes the responsibility for determining transfer credit that meets University requirements in three areas: General Education, the Industrial Technology major (based on previous course-by-course articulation agreements existing for transferable courses), and other courses acceptable as university-level courses. The Admissions Office posts the student’s complete records, including the results from the transfer credit evaluation, electronically on the University’s GET record keeping system. The student’s assigned Industrial Technology Primary Advisor then accesses these records and evaluations on GET and determines which additional courses, if any, from among those granted transfer credit, meet specific requirements of the Industrial Technology program. Such substitutions are studied carefully and require the approval of the student’s advisor.

Once students (transferring or continuing) have declared Industrial Technology as their major and have met all prerequisites to enroll in major-related courses, the evaluation of students is assumed primarily by individual Industrial Technology faculty. These faculty members generally rely on standard evaluation tools such as exams, quizzes, homework assignments, design projects, computer assignments, oral presentations, written assignments, and a University-required final examination to measure student performance in their courses.

As indicated above, the ongoing evaluation of students becomes integrated throughout the curriculum and decentralized by virtue of the fact that each professor chooses his or her own ways to evaluate students. However, the Industrial Technology program ensures certain evaluation standards, e.g., all students must have the ability to apply mathematics and science through the implementation of prerequisites (MATH 104A Pre-calculus: Algebra, PHYS 156 Physics for the 21st Century or CHEM 151 Fundamentals of Chemistry) testing, and certain required across-the-board evaluations.

For example, writing is evaluated through the University Writing Proficiency Exam, which all students must pass before they complete 135 quarter units. Students’ writing and oral communication skills are evaluated and strengthened in courses such as TECH 400 Written Communication Skills for Industrial Technology (passing the WPE is required prior to registration for TECH 400), COMM 150, and the Industrial Technology capstone design course TECH 495 Practicum in Industrial Technology.
Students’ ability to work in teams is developed and evaluated in a variety of lecture and laboratory courses.

Finally, all students are formally evaluated two quarters before their anticipated graduation. The pre-graduation evaluation process ensures that students have satisfied all curricular requirements and have achieved at least a 2.0 GPA in the following four areas:

1. all units attempted (including units accepted as transfer units)
2. all units attempted at CSULA;
3. all courses used to meet the General Education requirements; and
4. all courses required for the Industrial Technology major.

Students who transfer from universities in other states go through the normal application process wherein their transcripts are evaluated.

**Student Retention Standards**

As students’ progress through the Industrial Technology program, they are monitored in a number of ways. First, the University Office of the Registrar flags any student who fails to maintain "good academic standing" (determined by the criterion that all students must maintain a minimum overall GPA of 2.0). Students whose GPA drops below 2.0 are automatically placed on academic probation. A letter is sent by the University to all students on probation requiring them to meet with their faculty advisor to discuss a remedial course of action. Students whose grade point deficiency becomes excessive are disqualified and can only be reinstated with the approval of the department chair.
Faculty members are primary evaluators of students in the University. Student performance is evaluated by a grade, as indicated in Table 7.6.2, in each course.

Table 7.6.2 Grade Symbols

<table>
<thead>
<tr>
<th>GRADE SYMBOL</th>
<th>EXPLANATION</th>
<th>GRADE POINTS EARNED (PER UNIT VALUE OF COURSE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Superior</td>
<td>4.0</td>
</tr>
<tr>
<td>A-</td>
<td>Outstanding</td>
<td>3.7</td>
</tr>
<tr>
<td>B+</td>
<td>Very good</td>
<td>3.3</td>
</tr>
<tr>
<td>B</td>
<td>Good</td>
<td>3.0</td>
</tr>
<tr>
<td>B-</td>
<td>Better than average</td>
<td>2.7</td>
</tr>
<tr>
<td>C+</td>
<td>Above average</td>
<td>2.3</td>
</tr>
<tr>
<td>C</td>
<td>Average</td>
<td>2.0</td>
</tr>
<tr>
<td>C-</td>
<td>Below average</td>
<td>1.7</td>
</tr>
<tr>
<td>D+</td>
<td>Weak</td>
<td>1.3</td>
</tr>
<tr>
<td>D</td>
<td>Poor</td>
<td>1.0</td>
</tr>
<tr>
<td>D-</td>
<td>Barely passing</td>
<td>0.7</td>
</tr>
<tr>
<td>F</td>
<td>Non-attainment</td>
<td>0.0</td>
</tr>
</tbody>
</table>

The GPA is computed by dividing the total number of grade points earned by the total number of units attempted. Undergraduate students are expected to maintain a C (2.0) average in all courses attempted at Cal State L.A. and any other college or university attended and to make satisfactory progress toward their academic objectives as described in the catalog.

In addition to being monitored by their primary advisors upon advisement, students are tracked through the University on-line administrative tools and record keeping systems. The GET system provides web-based access to student records and information data. The Academic Advisement module within the GET is used to track the requirements and rules which a student must satisfy in order to graduate. The Academic Advisement Module offers great flexibility for the advisor to indicate "course substitutions" and "advisor-approved electives". At this time, only the department chair and primary advisors have access to GET on-line course substitution features.

Academic Plan Templates are built based on approved curriculum. These templates form a basis for generating Student Advisement Reports which will provide real time information regarding the student’s progress towards the degree. Both advisors and students who might be interested in changing their major to Industrial Technology have the ability to run "Quick What-If" audits to generate Student Advisement Reports that clearly indicate all the missing requirements for the degree.

Catalog Procedures and Regulations
The GET/SA provides access to services and information tailored to each student. It offers registration and other online services such as student account and transcript information. Prerequisites are enforced on GET. The GET registration system will prevent students from registering for a class without meeting prerequisites. The prerequisites can be met by any articulated transfer course. If the student has met the prerequisites by any non-articulated transfer course, he or she must meet with his or her advisor.

Scholastic success of undergraduate students is listed in the University catalog at:

[Catalog - Student Scholastic Success](#)

**College of ECST Programs and Services**

Student Academic Support Services (SASS) is composed of a range of programs through which student services are offered. SASS is dedicated to supporting the mission of the College of ECST by increasing the number of students in the educational pipeline through services offered to pre-college students in middle schools and high schools, partnering with feeder community colleges, and incorporating student success and retention strategies at the undergraduate level. Services are provided through the following programs.

1. **MESA Schools Program (MSP)**

   MSP provides academic development for middle school and high school students so they will succeed in math and science and go on to attain baccalaureate degrees in math-based majors. The MSP partners with math and science teachers to administer the program at local schools.

2. **MESA Engineering Program (MEP)**

   MEP is an academic program that supports students who are underrepresented in engineering or computer science to attain four-year degrees. MEP employs various student retention strategies including academic monitoring, academic excellence workshops in math, cornerstone engineering courses, course clustering, Introduction to Engineering orientation courses, student study center, and connections to student organizations. MEP also fosters the leadership and professional development of students through college and national conferences hosted through various student organizations. These services are available to Industrial Technology majors.

3. **Summer Transition into ECST Program (STEP)**

   The purpose of STEP is to provide access for educational development and excellence in mathematics for ECST incoming freshman students. It targets the inadequate preparation in mathematics that hinders many students from pursuing an engineering degree in a successful and timely manner. STEP aims at helping students reinforce their math skills and bridge them to the next level in mathematics before starting their first quarter at Cal State LA.
In addition, this retention program establishes an early support network and fosters personal relationships among freshman students, student leaders, faculty, and staff to aid with the transition from high school to college and provides various personal development workshops to assist with the academic rigors students may face during their first-year-experience in the College of ECST.

4. ECST Advisement and Recruitment Center

This office provides an array of services to prospective students, incoming freshman, and second-year students in engineering majors, and coordinates new student orientation (first-time freshmen) and class scheduling for all majors in the College. Staff activities include the following:

- Make presentations at various high schools and community colleges to increase awareness about academic and support programs within the College of ECST and university admission requirements.
- Work closely with academic departments within ECST to increase the number of students that attend.
- Host freshman and transfer orientation sessions,
- Assist students with scholarship and internship opportunities,
- Provide staff academic advisement.
- As freshmen, the students are engaged in the learning communities and academic excellence workshops.
SERVICES

<table>
<thead>
<tr>
<th>First and Second-Year Transition and Retention Programs</th>
<th>MSP</th>
<th>MEP</th>
<th>Advisement Center</th>
<th>STEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-Year Experience</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>New Student Orientation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Learning Communities</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Introduction to Engineering Courses</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Academic Excellence Workshops</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Academic &amp; Personal Advisement</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Leadership Development</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Professional Development</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Peer Mentor Program</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Connections to Student Organizations</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Scholarships</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Hands-on-Math and Science Enrichment</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Teacher Professional Development</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Career and College Explorations</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

With the Registrar's monitoring system using GET, the availability of student support services of the College of ECST, advisors in the Department of Technology are a part of comprehensive, effective process for monitoring students.

Each student who is certified through the granting of an ITEC BS degree has been thoroughly evaluated, advised, and monitored throughout his or her academic career. Through this process, the Industrial Technology faculty and Department chair are confident that all Industrial Technology graduates have met program educational objectives and outcomes and possess the skills, knowledge, attitudes, values, and interest specified in ATMAE's outcomes for programs.

Retention Information Resources

Each quarter, the Office of Institutional Research (IR) at Cal State L.A. prepares a variety of reports for administrators. The Dean of the College of ECST receives a report on grade distribution within the college, the five departments, grading patterns by individual courses, and faculty members. Deans are to review these grading patterns and monitor them within departments in the College. The distribution of grades (GPAs) for the entire university, the College of ECST and the Department of Technology are shown in Figure 7.6.2. The majority of our majors are transfer students and therefore Industrial Technology (ITEC BS) majors' GPA distributions compare favorably to the College of ECST when compared at the Upper Division level.
## GPA DISTRIBUTIONS

<table>
<thead>
<tr>
<th>STUDENT LEVEL</th>
<th>CUMULATIVE GPA</th>
<th>ACADEMIC YEAR 2010-11</th>
<th>ACADEMIC YEAR 2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNIVERSITY</td>
<td>COLLEGE OF ECST</td>
<td>BS ITEC</td>
</tr>
<tr>
<td>LOWER DIVISION</td>
<td>≤ 1.99</td>
<td>396</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>≤ 2.99</td>
<td>2,490</td>
<td>265</td>
</tr>
<tr>
<td></td>
<td>≥ 3.00</td>
<td>1,901</td>
<td>201</td>
</tr>
<tr>
<td>UPPER DIVISION</td>
<td>≤ 1.99</td>
<td>96</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>≤ 2.99</td>
<td>6,281</td>
<td>584</td>
</tr>
<tr>
<td></td>
<td>≥ 3.00</td>
<td>4,110</td>
<td>293</td>
</tr>
</tbody>
</table>

(1) Academic Year includes fall, winter and spring.

(2) Academic Year headcount = round ((fall + winter + spring)/3)

Figure 7.6.2 – GPA Distributions by University, College and Department

### 7.7 Student Enrollment

There shall be evidence of an adequate number of program majors to sustain the program, and to operate it efficiently and effectively. Program enrollment shall be tracked and verified.

The Department of Technology historically has had difficulty in tracking majors due to multiple degree programs and previously having three options for the Industrial Technology program. An extensive amount of curriculum change has occurred. A brief description of the curricular changes is provided below along with discussion of enrollment trends impacted by state budget issues affecting transfer student applications.

The current enrollment in the program continues to rebound toward 2008 levels and we expect greater enrollment growth over the next five years as we set up block articulations (23-unit lower division) with community colleges programs. Evidence of enrollment applications, enrollment history and ethnicity and gender is provided. Based upon the curricular changes we have made and the strategic decision to incorporate block articulations.
Background on the Department of Technology

The Department of Technology currently offers four bachelor degrees:

1. Aviation Administration (AVAD BS)
2. Fire Protection Administration (FPAT BS)
3. Graphic Communications (GRAF BS)
4. Industrial Technology (ITEC BS)

Prior to fall of 2008, the B.S. Industrial Technology program had the following three options:

1. Aviation Administration (became B.S. Aviation Administration in 2005)
2. Printing Management (became B.S. Graphic Communications in 2003)
3. Production Technology (dropped)

The option in Printing Management became the B.S. in Graphic Communications in 2003, and the option in Aviation Administration became a separate degree in 2005. As part of the program modification, the Production Technology option was dropped and the Industrial Technology became a standalone degree effective fall 2008.

Three factors that drove the program modification were:

1. Reducing the number of units in the major from 192 to 180 as directed by the CSU Chancellor’s Office.
2. Creating separate major codes to better track students applying to, and graduating from, the programs; and providing Aviation Administration and Graphic Communications students a title on their diplomas reflective of their programs.
3. Removal of options would then better position the department to pursue ATMAE accreditation of the new B.S. Industrial Technology program.

Enrollment in the new Industrial Technology program has become easier to track in terms of headcount now that the degree no longer has options. Table 7.7.1 below illustrates the enrollment in the program during fall quarter for the years 2008 to 2012. It appears as though the program experienced a decline in majors from 2008 to 2010; however, this could be a result of students who were in other options (Aviation and Printing Management) being carried over within the old Industrial Technology program.

Another serious impact on enrollment from 2009 to 2010 can be attributed to the budget problems for the State of California. A reduction of the number of students being admitted and tighter controls on admissions procedures for admittance came about because of the reduced budget for CSULA. As a result, transfer students who normally applied during any of the four quarters where relegated to applying only for fall quarter much like first-time freshmen from high schools. Transfer students were not admitted for spring 2009, winter 2010, spring 2010 and summer 2010.
Table 7.7.1 Fall Quarter Industrial Technology Enrollment History 2008–2012

<table>
<thead>
<tr>
<th>Fall Term</th>
<th>First-Time</th>
<th></th>
<th></th>
<th>Continuing</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Freshmen</td>
<td>Transfer</td>
<td>Undergrads</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>2008</td>
<td>2</td>
<td>1.96</td>
<td>12</td>
<td>11.76</td>
<td>88</td>
<td>86.27</td>
<td>102</td>
</tr>
<tr>
<td>2009</td>
<td>2</td>
<td>2.35</td>
<td>6</td>
<td>7.06</td>
<td>77</td>
<td>90.59</td>
<td>85</td>
</tr>
<tr>
<td>2010</td>
<td>1</td>
<td>1.45</td>
<td>9</td>
<td>13.04</td>
<td>59</td>
<td>85.51</td>
<td>69</td>
</tr>
<tr>
<td>2011</td>
<td>7</td>
<td>7.14</td>
<td>22</td>
<td>22.45</td>
<td>69</td>
<td>70.41</td>
<td>98</td>
</tr>
<tr>
<td>2012</td>
<td>6</td>
<td>6.19</td>
<td>10</td>
<td>10.31</td>
<td>81</td>
<td>83.51</td>
<td>97</td>
</tr>
</tbody>
</table>

Table 7.7.2 on the next page shows a comparison from fall quarter 2007 through fall quarter 2012 of the number of prospective Industrial Technology majors who applied, were admitted and enrolled. The number of applications and students admitted to the program has more than doubled during the fall since 2007. The number of students who have officially enrolled in classes varies from year to year and could be affected by a variety of factors including meeting application deadlines for the deposit, transcripts, finances, and GPA requirements for students accepted out of the immediate service area.

This table also identifies the number of Industrial Technology majors graduating each quarter beginning in fall 2007, and compares the number of new enrolled majors (132) to the total number of graduates (135). With ongoing recruitment activities and the ability for community college students to transfer 23 units of lower division technical coursework via block articulations and 39 units of lower division general education, we anticipate an increase in applications and enrollments to grow in the next few years. Many community college articulation officers and transfer counselors are becoming more aware of the opportunities for their students to transfer to a four-year program.
**Table 7.7.2 Industrial Technology Enrollments vs. Graduations by Quarter**

<table>
<thead>
<tr>
<th>Term</th>
<th>Applied</th>
<th>Admitted</th>
<th>Enrolled</th>
<th>Graduated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2007</td>
<td>53</td>
<td>40</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>Winter 2008</td>
<td>12</td>
<td>9</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Spring 2008</td>
<td>13</td>
<td>9</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Summer 2008</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Fall 2008</td>
<td>43</td>
<td>30</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Winter 2009</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Spring 2009</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Summer 2009</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Fall 2009</td>
<td>49</td>
<td>22</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Winter 2010</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Spring 2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Summer 2010</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Fall 2010</td>
<td>52</td>
<td>35</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Winter 2011</td>
<td>11</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Spring 2011</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Summer 2011</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fall 2011</td>
<td>127</td>
<td>88</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>Winter 2012</td>
<td>9</td>
<td>6</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Spring 2012</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>Summer 2012</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Fall 2012</td>
<td>140</td>
<td>89</td>
<td>21</td>
<td>6</td>
</tr>
</tbody>
</table>

**Total new students in the ITEC BS program**: 132

**Total no. of students who have graduated from the ITEC BS program**: 135

The breakdown in ethnicity for Industrial Technology majors is shown below in Table 7.7.3. The majority of Industrial Technology students are Hispanic (57.7%) followed by Asian (15.5%) then White (7.22%). Eleven percent of our majors are female.

**Table 7.7.3 Summary of Gender and Ethnicity - fall 2012**

<table>
<thead>
<tr>
<th>GENDER</th>
<th>ASIAN</th>
<th>HISPANIC</th>
<th>BLACK</th>
<th>WHITE</th>
<th>INTERNATIONAL</th>
<th>UNKNOWN</th>
<th>AMERICAN</th>
<th>INDIAN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>F</td>
<td>3</td>
<td>3.09</td>
<td>4</td>
<td>4.12</td>
<td>2</td>
<td>2.06</td>
<td>1</td>
<td>1.03</td>
<td>0</td>
</tr>
<tr>
<td>M</td>
<td>12</td>
<td>12.4</td>
<td>52</td>
<td>53.6</td>
<td>3</td>
<td>3.09</td>
<td>6</td>
<td>6.19</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>15.5</td>
<td>56</td>
<td>57.7</td>
<td>5</td>
<td>5.15</td>
<td>7</td>
<td>7.22</td>
<td>2</td>
</tr>
</tbody>
</table>
Figure 7.7.1 below shows the student demographic profile by ethnicity; and Figure 7.7.2 shows the student ethnicity demographic profile by gender.
7.8 Administrative Support And Faculty Qualifications

There must be evidence of appropriate administrative support from the institution for the technology, management, and applied engineering program/option including appropriately qualified administrators, an adequate number of full-time faculty members and budgets sufficient to support program/option goals. Full-time faculty assigned to teach courses in the technology, management, and applied engineering program/option must be appropriately qualified. Faculty qualifications shall include emphasis upon the extent, currency and pertinence of: a) academic preparation; b) industrial professional experience (such as technical supervision and management); c) applied industrial experience (such as applied applications); d) membership and participation in appropriate technology, management, and applied engineering professional organizations; and e) scholarly activities.

The faculty of the Department of Technology is actively engaged with a wide variety of activities and committee assignments within the College and the University. The Department has always been recognized as an asset to the College and supported strongly by the Dean. University administrators are well aware of the commitment by our faculty to University priorities, i.e., WASC Accreditation, GET Training, student recruitment, University Strategic Planning) and our involvement in the campus community. Faculty are highly qualified and 100% of our tenure-track and full-time faculty members have an earned doctorate. We have established selection, appointment, reappointment and tenure procedures with a strong emphasis on high quality instruction.

Faculty Teaching, Advising, and Service Loads

Every full-time faculty member's academic assignment at the University includes teaching and instruction-related responsibilities such as office hours, advisement and committee work at the department, college or university levels.

<table>
<thead>
<tr>
<th>FULL-TIME FACULTY ACADEMIC ASSIGNMENT =</th>
<th>12 WEIGHTED TEACHING UNITS + 3 SERVICE UNITS/QTR (x 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COURSE RELEASE TIME GRANTED FOR:</td>
<td></td>
</tr>
<tr>
<td>• Assessment Coordinator</td>
<td>INTERNAL GRANTS</td>
</tr>
<tr>
<td>• Advisement</td>
<td>• Creative leave</td>
</tr>
<tr>
<td></td>
<td>• Sabbatical leave</td>
</tr>
<tr>
<td></td>
<td>EXTERNAL GRANTS</td>
</tr>
<tr>
<td></td>
<td>• NSF, DoE, or other agencies</td>
</tr>
</tbody>
</table>

All full-time faculty have a teaching load that spans three quarters, with twelve weighted teaching unites (WTU) per quarter. This typically involves teaching three separate courses every quarter. The only means to reduce the teaching load are with 1) internal grants (creative leave or sabbatical leave), 2) external grants (funding from NSF, DoE, or other agencies), or 3) course release time is offered for specific duties such as advisement, serving assessment coordinator. The thirty six annual WTU load for faculty is spread over three quarters. In addition, faculty members are involved in general student advising and other committee assignments to satisfy the required three WTU of service activities per quarter.
The Chair is responsible for ensuring that all faculty members fulfill their contractual workload assignments.

Lecture classes in the Department use a course classification number of C4, with a workload K-factor of 1 weighted unit per unit of credit, i.e., a four-unit lecture course equals four weighted units. Activity classes (lecture/lab) use a course classification number of C15 and earn one and one half weighted units per unit of credit due to the increased number of contact hours required to deliver courses with this format.

Teaching one three-unit activity course would provide the faculty member with 3.75 weighted units. The calculation of 3.75 is shown below with an example lecture/lab course:

**TECH 110 Introduction to Drafting** (3 Units: 1.5 lecture /1.5 lab)
- C4 Lecture (1.5 units x 1.0 Workload K-factor) = 1.5
- C15 Activity (1.5 units x 1.5 workload K-factor) = 2.25

**Appropriate Administrative Support for the Industrial Technology Program**

Institutional support for Department of Technology programs consists of support for full-time faculty, part-time faculty, staff, facilities, equipment, computer hardware/software, and operations and maintenance. The total budget for the department is provided by resources from the College of Engineering, Computer Science, and Technology. The budget details for the current and previous fiscal years listed below in Table 7.8.1.

<table>
<thead>
<tr>
<th>Table 7.8.1 – Department of Technology Budgets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expenditure Categories</strong></td>
</tr>
<tr>
<td>Instructional Faculty</td>
</tr>
<tr>
<td>Non-Faculty</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Student Assistant</td>
</tr>
<tr>
<td>Travel</td>
</tr>
<tr>
<td>Misc. Operating Exp.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

1. Data excludes benefits.
2. Instructional Faculty includes Graduate Assistant and Teaching Associate.
3. Non-Faculty includes Special Consultant-Faculty and Dept Chair Salary.
4. FY 2012-13 includes data up to 6-Month Assessment Report.
5. Expenditures include encumbrances.
In fall 2012, there are 6.0 full-time equivalent faculty (FTEF) teaching positions in the Department of Technology (full-time and part-time positions). Table 7.8.2 below shows the department FTEF totals dating back to fall quarter 2008 compared to the College of ECST and the University as a whole. Reasons for the reduction in FTEF for the department is related to severe budget cuts faced by the California State University system impacting the part-time instructor budget and because two Department of Technology faculty members, Drs. Don Maurizio and Benjamin Lee, have served in the position of Acting Associate Dean for the College of ECST.

Table 7.8.2 – Full-Time Equivalent Faculty (FTEF) in Department of Technology

<table>
<thead>
<tr>
<th>FALL TERM</th>
<th>DEPT. FTEF</th>
<th>COLLEGE</th>
<th>UNIVERSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>13.1</td>
<td>54.6</td>
<td>784.7</td>
</tr>
<tr>
<td>2009</td>
<td>7.5</td>
<td>45</td>
<td>694.4</td>
</tr>
<tr>
<td>2010</td>
<td>8.5</td>
<td>53.9</td>
<td>708.8</td>
</tr>
<tr>
<td>2011</td>
<td>6.53</td>
<td>57.51</td>
<td>757.02</td>
</tr>
<tr>
<td>2012</td>
<td>6.0</td>
<td>50.7</td>
<td>757.5</td>
</tr>
</tbody>
</table>

Even in tough budget times, leadership from the College has been very supportive of the Department’s teaching needs, supporting the hiring of part-time faculty for other programs in the department that have a single full-time faculty member. The Dean has been very helpful in providing financial resources to support faculty, laboratory improvement, and computer hardware needs.

The composition of the full-time faculty changed after 2005 with the unexpected passing of Dr. James Ettaro, a highly regarded faculty member instrumental in establishing our focus on Power, Energy, and Transportation. It was he who championed the idea of fundraising and building a Hydrogen Fueling Station. The Department of Technology and the College requested permission to advertise for a new faculty position. President Rosser and then Provost Lujan were extremely supportive of the Department of Technology’s need to hire a new faculty member in Power, Energy, and Transportation resulting in the hiring of Dr. David Blekhman in 2007. The following year the Department was able to hire Dr. Mauricio Castillo (2008) as a full-time tenure track faculty member after teaching in the department for one and half years as a full-time temporary faculty member.
Adequate Number of Full-Time Faculty to Teach Courses

Currently the Industrial Technology program has approximately 100 FTE students enrolled. There is an adequate number of faculty teaching courses in the program. It is anticipated that a number of faculty members could possibly retire and/or participate in the Faculty Early Retirement Program (FERP) over the next five years.

Faculty Qualifications

Academic Preparation

All of the faculty members who teach in the Industrial Technology program have an earned doctorate as delineated in the Department of Technology’s Appointment, Retention, Tenure and Promotion (ARTP) document. Table 7.8.3 below lists the full-time tenured and tenure-track Industrial Technology faculty currently includes:

<table>
<thead>
<tr>
<th>FACULTY NAME AND RANK</th>
<th>HIGHEST DEGREE</th>
<th>UNIVERSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. David Blekhman</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Mauricio Castillo</td>
<td>Assistant Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Jai Hong</td>
<td>Associate Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Benjamin Lee</td>
<td>Full Professor</td>
<td>D.I.T.</td>
</tr>
<tr>
<td>Dr. Ethan Lipton</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Paul Liu</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Le Tang</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Virgil Seaman</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Dr. Stephanie Nelson</td>
<td>Full Professor</td>
<td>Ph.D.</td>
</tr>
</tbody>
</table>

Curriculum vitae of the regular full-time faculty teaching courses in the Industrial Technology program will be made available in the resource room in the Appendices on our SharePoint server. The minimum academic degree for a tenure-track faculty is outlined in the Appointments, Retention, Tenure and Promotion (ARTP) document for the Department of Technology. The doctoral degrees specified include: Ph.D., Ed.D. and D.I.T (Industrial Technology). Many of our faculty and applied industrial experiences based upon relationships with companies and through grant-related activities and are involved with scholarly activities.

Faculty members in the Industrial Technology program belong to a variety of professional organizations including:

- Association of Technology Management and Applied Engineering (ATMAE)
- American Society for Engineering Education (ASEE)

2 Don Maurizio who recently retired had an Ed.D. degree (as stated in our ARTP).
Faculty Selection and Appointment Policies and Procedures

Recruitment of faculty in the Department of Technology will be a priority over the next five years due to the recent retirement of Dr. Don Maurizio and other anticipated retirements. The department has not hired a new full-time tenure-track faculty member since the hiring of Dr. Blekhman and Dr. Castillo. The department has not been allowed to hire due to severe State budget problems affecting hiring for the entire University.

In the Faculty Handbook, Chapter 6, Section B, the first paragraph states:

“Recruitment should be based on explicit long-term (three- to five-year) plans developed on the basis of careful forecasting of curriculum developments for each department/division/school, projected changes in class size limits related to changes in content and methods of instruction in each class, changing needs for each offering, projected student/faculty ratios, projected FTES, and the Statement of Diversity and Inclusivity.”

As part of its long-term planning, the department has laid out a priority to hire an additional faculty member for the Fire Protection Administration program. Replacement faculty for the Industrial Technology program will need to be considered when current faculty members retire.

Recruiting and Hiring Procedures

Going forward, the department will need to develop a three-year hiring plan based on programmatic needs. The plan takes into account factors such as unmet instructional need, student-faculty ratios, undergraduate and graduate program enrollment, department enrollment targets, rank and demographic distribution of faculty, University mission, approved faculty recruitment under way, and other quantitative and qualitative considerations. This plan is then provided to the college dean for his review and incorporation into the College Hiring Plan, which provides the basis for annual recruitment requests to the Provost.

Detailed information about recruitment and hiring policies can be found in the CSULA Faculty Handbook. Chapter 6 Section B covers policies for “Appointment, Retention, Tenure, Promotion, and Evaluation Recruitment of Faculty.”
Faculty Tenure and Reappointment Policies and Procedures

The normal probationary period for full-time tenure-track faculty members at Cal State L.A. spans seven years, and tenure is considered in the sixth year. Faculty retention, tenure, and promotion (RTP) policies and procedures in the Department of Technology are comparable to other program areas on campus. Requirements for educational performance, professional achievement, and contributions to the University are described for all faculty in the Department of Technology and can be reviewed in the 2007-2010 Department of Technology ARTP document. The document can be found online via the Academic Affairs web page entitled “RTP Policies and Procedures.” The second paragraph on the site provides a link to Department, Division, and School policy documents. The Department of Technology ARTP document located under the College of Engineering, Computer Science, and Technology provides the most current policy document. The document can be accessed by clicking here.

7.9 Facilities, Equipment and Technical Support

Facilities and equipment, including the technical personnel support necessary for maintenance, shall be adequate to support program/option goals. Evidence shall be presented showing the availability of computer equipment and software programs to cover functions and applications in each program area. Facility and equipment needs shall be included in the long-range goals for the program.

The computer laboratories, smart classrooms and facilities unique to the Industrial Technology program and its concentrations are adequate to support program goals. The University and the College of Engineering, Computer Science, and Technology (ECST) have provided some of the best computer laboratories and smart classrooms on campus and insure that we maintain currency of our computer software programs. The Department of Technology continues to include facility and equipment needs in the Five-Year plan and faculty members continue to pursue external funding for facility improvement and equipment with strong support from the University and the College.

A. Offices, Classrooms and Laboratories

1. All of our full-time faculty members have individual offices.

2. Most of the Industrial Technology undergraduate student teaching takes place in the Engineering and Technology Building, which houses all of the College’s faculty and staff, laboratories, and computing facilities, and many of its classrooms. All classrooms are assigned at the university level. This means that large classes are sometimes assigned classrooms that are not in the E&T building. However, most of the Technology classes are held in the E&T building. The E&T classrooms are well suited for lectures and are well maintained. All are equipped with dry-erase boards, a projector, and a screen. In many cases they are multimedia ready. Additional audio-visual equipment, such as slide projectors, computer projectors, and video playback equipment, can be obtained upon request.
3. The entire Engineering and Technology Building continuously goes through renovation. As a result, all laboratory facilities are constantly being modified. New cabinetry and shelving, benches, sinks, acid-resistant countertops, a versa-duct power distribution system with voice and data ports, new HVAC, new laboratory air, gas and vacuum, and cabinets for flammable and acid containers have been installed throughout the laboratory facilities. The most recent laboratory renovation that is ongoing is in E&T B13 which is in the Power, Energy, and Transportation area. A separator wall with windows has been installed with a sink and new electrical connections.

Some laboratory facilities are shared with the Departments of Civil Engineering, and Mechanical Engineering. For each shared laboratory, each department has a laboratory coordinator. The laboratory coordinators are responsible for coordinating laboratory equipment needs among the departments and for the general maintenance of the laboratories.

Design Laboratory (E&T C-254)

This computer laboratory is equipped with 20 CAD workstations (i7 Quad Core) with 21 inch monitors. Each workstation has a sketch table next to it. This laboratory provides the latest in CAD software tools including AutoCAD, SolidWorks, CATIA V5-R19 and DELMIA V5 – R19. Examples of courses taught in ET C254 include TECH 110 Introduction to Drafting, and TECH 144 Introduction to Industrial Design.

Automated Manufacturing Laboratory (E&T B-109)

This facility houses 2 CNC milling machines, 1 CNC lathe, 1 robotic arm with enclosure, 1 wire EDM, 1 laser cutter, 1 digital scanner, 1 CNC router, 1 CMM, and 2 additive manufacturing machines (FDM and ZCORP). It also has a display case showing projects done in the past. This lab is serving TECH 466 Computer Aided Manufacturing, TECH 467 Emerging Manufacturing Technologies, and TECH 495 Industry Practicum.

CAD/CAM Classroom/Laboratory (E&T B-110)

This laboratory is equipped with 18 CAD/CAM workstations (i7 Quad Core) and 21 inch monitors. This laboratory provides the latest in CAD/CAM software tools including AutoCAD, SolidWorks, CATIA V5-R19 and DELMIA V5 – R19. The front of the classroom contains seating for lecture and demonstration. Courses that have been taught in this room include TECH 360 Modern Manufacturing, TECH 310 The Design Process, TECH 466 Computer Aided Manufacturing, TECH 482 Metrics for Industry, and TECH 495 Industry Practicum.
Manufacturing Laboratory (E&T B-111)

This laboratory is equipped with a Water Jet CNC Cutter, a TIG Welder, two Drill Press, three Band Saw (two horizontal and one vertical). This laboratory provides a space for basic metal separation and fabrication processes. Also, most of the parts assembly operations were performed in this lab because of the availability of work benches.

Manufacturing Laboratories (E&T B-112 & 113)

These laboratories are laid out for traditional metal manufacturing technology. These labs are equipped with four engine lathes, six vertical milling machines (two digital read-out, two CNC, and two manual). Sand Casting and fabrication equipment (MIG and Arc welding) are also placed. Courses that have been taught in these labs include: Tech 160 – Introduction to Metal Working, Tech 460 – Manufacturing, Materials, and Processes, and ME 114 – Basic Metal Working. These labs along with the other labs listed above not only utilized for class activities but also heavily used for special projects for WESTEC Manufacturing Challenge Competition, AeroDef Manufacturing Challenge, and various other student projects.

Electronics Laboratory (E&T B-105)

This laboratory supports instruction in basic electronics measurements and experimentations. The lab has 12 stations equipped with basic electronic instruments like digital multimeters, oscilloscopes, DC power supplies, function generators, and frequency counters. Also stored in the lab are various electronic kits for both analog and digital electronic experimentations. This lab is partially shared with Department of Electrical Engineering on their lab instruction of electronic communication. The laboratory is mainly used for teaching TECH 120, DC Electronics. It is also used for lecture parts of TECH 421 – Internetworking and other courses in the Internetworking concentration (TECH 422, 423, 424). In addition EE 321 Communication Lab is also taught in this lab.

CISCO Laboratory (E&T B-106)

This laboratory supports all lab experiences in the internetworking concentration. It has 8 racks populated with networking devices like routers, switches, and firewalls. Each rack has at least 3 routers and 3 switches as the basic network topology. All network devices have console access with laptops. Other network devices like WAN simulators, security servers, local servers, etc. are stored in this lab. In addition there are 6 soldering stations ready for student projects. The courses taught in this lab include TECH 421, 422, 423, and 424 plus the project portion of TECH 120.

Resource Library (E&T B-106A)

This resource library serves as a library for all electronic data manuals and references as well as a project discussion room for students engaging in their projects.
Graphic Communications Laboratories (E&T B-9, B-10, and B-10a)

This laboratory is currently being modified to serve as the center of the Graphic Communications Laboratory Suite (B-9, B-10, B-10A, B-10B, and B-10C). When completed, it will include equipment appropriate to support student learning experiences related to the basic graphic combinations processes, digital and offset lithography prepress, quality control, and finishing operations. The front of the laboratory features a faculty workstation with external speakers connected to a ceiling-mounted data projector. Courses that will be taught (in whole or in part) using this room include TECH 130 Introduction to Graphic Communications, TECH 234 Photo Offset Lithography, TECH 330 Graphic Communications Processes and Materials, TECH 434A Graphic Communications Production Management, TECH 436 Electronic Publishing Technology & Management, and TECH 437 Alternative Media Production.

Electronic Publishing and Computer Graphics Laboratory (E&T B-9)

This laboratory is equipped with 24 iMac workstations with 27 inch monitors and 24 Hewlett Packard Compaq Elite 8200 workstations with 21 inch monitors. This laboratory provides the latest in Adobe Creative Suite (CS6) Master Collection software tools including: Acrobat, Audition, Bridge, Dreamweaver, Fireworks, Flash Illustrator, Photoshop, InDesign, and Premier. The front of the classroom features faculty workstation with external speakers connected to a ceiling-mounted data projector. Output needs for this room are supported through the network with by a 11” x 17” black and white laser printer (in the rear of the room) and two 11” x 17” color laser printers available in the adjacent Electronic Imaging Lab (ET B10C). Courses that have been taught using this room include TECH 130 Introduction to Graphic Communications, TECH 234 Photo Offset Lithography, TECH 330 Graphic Communications Processes and Materials, TECH 434A Graphic Communications Production Management, TECH 436 Electronic Publishing Technology and Management, and TECH 437 Alternative Media Production.

Digital Imaging Laboratory (E&T B-10C)

The modification of this laboratory is nearing completion to support digital imaging learning experiences. The laboratory is currently equipped with 4 Macintosh workstations with 23 inch monitors and 4 Hewlett Packard Compaq Elite 8200 workstations with 21 inch monitors which are equipped with the latest in Adobe Creative Suite (CS6) Master Collection software tools including: Acrobat, Audition, Bridge, Dreamweaver, Fireworks, Flash Illustrator, Photoshop, InDesign, and Premier. It also currently houses a scanner, two 11” x 17” color laser printers, and a large format printer.

Completion of currently approved plans will add two additional scanners, a 12” x 18” color ink jet printer, and a digital four-color press. Much of the equipment in this lab will be networked to other equipment across the Graphic Communication Laboratory Suite e. Courses that have been taught using this room include TECH 130 Introduction to Graphic Communications, TECH 234 Photo Offset Lithography, TECH 330 Graphic Communications Processes and Materials, TECH 434A Graphic Communications Production Management, and TECH 437 Alternative Media Production.
Communications Production Management, TECH 436 Electronic Publishing Technology & Management, and TECH 437 Alternative Media Production.

Audio/Video Studio and Control Center (E&T B-10A and B-10B)

The modification of this laboratory is underway and approval received to complete necessary acquisitions and installations. This facility is currently equipped with most of the infrastructure necessary to provide students learning experiences related to the creation and editing of video and audio. When the modifications are completed, this facility will include professional lighting and controls and production equipment to support the Industrial Technology program. Courses that will be taught using this facility include:

- TECH 130 Introduction to Graphic Communications
- TECH 330 Graphic Communications Processes and Materials
- TECH 384 Foundations of Technology Education
- TECH 493 Technology Education Facilities: Planning, Construction, Equipment, and Maintenance, and
- TECH 494 Industrial and Technology Education Curriculum.

Technology Education Laboratory (E&T B-11)

The Department of Technology has a well-equipped Technology Education teaching laboratory based on a project-based, modular approach, STEM projects, inquiry-based and other ways in teaching and infusing STEM. Some samples of equipment besides conventional equipment that is used in the lab range from a 3D printer, laser cutter, router, CNC machines, robotics, module based projects, and injection molding machines. Curriculum resources include Engineering byDesign model EbD™

Power, Energy, Transportation Laboratories (E&T B-13 & E&T B-14)

The Power, Energy and Transportation laboratory supports the Department of Technology courses in Advanced Engine Design, Fuel Cell Applications, Photovoltaic Applications, Computer Controls, Power Technologies and Electric, Hybrid and Alt. Fueled Vehicles. Students also utilize this space for current special projects such as the H2 Super Eagle and EcoCAR2.

The laboratory practicum is supported through the equipment listed on the next two pages:
Test and Service Equipment
  - "Super Flow" 1000Hp engine test cell, "Clayton Industries" 800 Hp chassis dynamometer, two vehicle lifts, and other items.
  - Electric and Hybrid Vehicle Equipment (both are used in public outreach events)
    - Solar Eagle Sunrayce 97
    - Full electric conversion **Porsche 911**
    - **Hybrid Honda Insight**
      - "**Magtrol**" 10 kW electric motor dynamometer
    - **Toyota Prius** hybrid drive demonstrator
    - Two outdoor EV charging stations
    - Electric motors, and more.

**Figure 7.9.1. Power, Energy and Transportation Program Equipment**
- **Fuel Cell Equipment**
  - Custom built research grade 25cm two-fuel cell test station
  - "Proton"-Hogen GC600 Electrolyzer
  - Educational equipment by "Heliocentris"
  - Dr. Fuel Cell, Nexa Training System Complete, Nexa Integration Kit, and various small demonstrators.

- **Photovoltaic Applications**
  - Building, grid-tied [9 kW photovoltaic installation](#) on the Engineering and Technology building, and more.

**Hydrogen Station and Research Facility**

Powered by 100% renewable resources, the station will deploy: a Hydrogenics electrolyzer, first and second stage compressors capable of fast-filling to 5,000 (350bar) or 10,000 psi (700bar), 60 kg of hydrogen storage, water purification, and various cooling and control systems. Generating up to 60 kg of hydrogen per day to fuel 15-20 vehicles, it will be the largest H2 fueling facility in the world operated by an academic institution. The station was designed and built with a hallway facilitating public tours of the plant and student training, a unique feature not found anywhere else. The station is located next to the Engineering and Technology building. The station will help to develop educational programs for sustainable engineering and advanced transportation as well as to facilitate research in performance optimization and renewable power smart grid.

![Hydrogen Station](image)

**B. Computing Resources**

Each full-time faculty and Department staff member is assigned either a desktop or a laptop computer, as chosen by them, with access to a laser printer. These are refreshed on a three-year cycle (approximately) as indicated by the university baseline plan. Part-time faculty and student assistants are also provided with computer access. Campus-authenticated wireless connectivity is also available via numerous wireless access points in the building.
Some Industrial Technology courses are taught in Computer Classrooms, each of which is equipped with a computer projector. The instructor and students all have networked computers in the computer classrooms.

In some instances, courses are taught in Smart Classrooms which are equipped with an instructor networked computer station and a computer projector. Some Computer Classrooms or Smart Classrooms are also equipped with Mediasite technology. Mediasite is a webcasting technology that completely automates the recording, distribution, management and analytics of high-quality video and multimedia presentations. Faculty present as usual with no need to learn new technology. By capturing the courses, faculty can build instant video libraries and provide a virtual classroom for students to watch at their convenience. This process should turn out to be significant for student retention.

The ECST’s Computer Productivity Center (CPC) supports the computing needs of engineering, computer science and technology students, faculty, and staff in the College. It provides facilities, hardware, software, and training to encourage the many uses and applications of computers as part of the educational experience (e.g., engineering computation, modeling and simulation, computer-assisted design, computer programming, graphics and laboratory applications).

The CPC is housed in a multi-room suite located in the Engineering and Technology Building (C-wing, second floor) that includes six primary-use rooms and three support rooms. In the center of the suite is a support area that consists of a student "help desk," file server room, plotter room, and director’s office. The help desk is surrounded by five computer classrooms: three for general college computer-related instruction and two for specialized use. The sixth primary use room is an open access facility.

The CPC’s flexible, functional design allows for support staff to monitor and assist in all areas of the CPC, while allowing for classroom privacy, as needed. Scheduling is done so that classrooms can provide additional open access stations during high demand time. When the entire facility is operating in "open access" mode, students have access to more than 150 workstations.

The open access facility (ET C255), known as the "ECST" is open six days and 68 hours per week during the quarter. The computer facility provides individual access to 42 workstations for student working on their studies.

C. Maintenance and Upgrading of Facilities

The Department of Technology has the services of a mechanical technician, an electro-mechanical Technician, and a machinist. In addition, the Department has the support of two Information Technology Consultants who are available to help faculty in integrating the use of computers in the curriculum. These highly qualified individuals maintain the equipment and provide support to faculty in laboratory courses. Parts are purchased through the Supplies/Services budget allocation to the Department. The top priority for the use of all resources is the maintenance and support of the existing laboratory facilities.
The Power, Energy, and Transportation laboratory (ET B13) is nearing completion of a recent upgrade including the installation of a separator wall with windows to create an additional lab space for to accommodate equipment acquired through a DOE grant for fuel cell curriculum development. This is in addition to the long range efforts to design and build a Hydrogen Station and Research Facility.

### D. Library Services

The John F. Kennedy Memorial Library’s mission is to provide instructional support for the campus. Detailed information about the University Library and the services provided can be found on its web page: [www.calstatela.edu/library](http://www.calstatela.edu/library).

To ensure that the Library achieves its mission, each College and its departments has a librarian liaison, which provides a single point of contact for all library needs. The liaison to the College of Engineering, Computer Science and Technology is Ken Ryan. In addition to a Masters in Library Science, and a Masters in Linguistics (Computational), Mr. Ryan has undergraduate work in the sciences as well as a Bachelor’s Degree in Mathematics, and worked for many years as a technical writer/editor and contracts manager for a Fortune 500 global semiconductor, sensors and controls and educational products & services corporation.

Over the years, the Library has striven to maintain its commitment to the College of Engineering, Computer Science, and Technology in a variety of ways, including support through the purchase of relevant materials – books, journals, electronic resources, media materials, etc. As with all publicly supported institutions, fiscal uncertainties and challenges continually present themselves. Hence, the annual totals above have fluctuated, based on the availability of extra funding from the campus (occasionally), drastic price increases from publishers (fairly routine), the need for expensive reference books and sets, and so forth. In balance, the average expenditures on behalf of the College of Engineering, Computer Science and Technology is about $76,000 annually. The Library is in the process of developing statistical allocation formulas to ensure that all campus departments, programs and colleges receive appropriate funding support in the Library for their respective programs.

In terms of the journal collection supporting the College, currently there are about 1,600 subscriptions, the vast majority of which (over 95 percent) are available online in full-text form. In addition to online full-text access to engineering articles in journals through journal publishers' websites, e.g., ASME Online Journals, Elsevier ScienceDirect, Wiley InterScience, etc.; and the Library subscribes to Ei Village which gives citation access and full-text links to a vast collection of scholarly engineering society and commercial and professional publications. Automatic linking systems ("Find It!", the local name for the ExLibris SFX platform), connect the user from a database citation to the full text of an article, or to an automated interlibrary loan ordering system through which articles may be ordered at no cost to the requestor with merely a few clicks of the mouse.
Electronic deliveries via e-mail are made in a matter of a few days. Additional interlibrary loan systems work in parallel to ensure that items that the Library does not own are made accessible to the user. The Library also provides assistance in setting up accounts with ILLiad and with Ingenta for document delivery. All of the Library’s electronic resources are available on- and off-campus to students and faculty.

The Library’s book collection currently includes 45,159 books in the engineering and technology call number ranges. Of these, 42,336 are circulating books and 2,823 are in the reference collection or reserved for library use only.

Finally, as part of its educational mission, the Library provides individual and group instruction as a part of its information literacy programs. Over the period of this review, nearly 1,000 students (and their instructors) from the College have participated in nearly 50 information literacy instruction sessions in the Library. While these numbers are modest in comparison with, for example, the numbers of information literacy sessions given by librarians to freshman English composition classes, they are significant in that the incoming freshmen and transfer students in the College are receiving an introduction to an important skill that will carry through with them throughout their careers and strengthen their marketability upon graduation.

The Library was instrumental in the development and deployment of our Information Literacy course (TECH 305) with the help of Catherine Haras. She assisted with the course proposal development and team taught the course when it was first offered. TECH 305 is a Required Core class taken by all Industrial Technology majors.

E. Closing Comments on Facilities, Equipment and Technical Support
The Instructional, Computing, Laboratory, and Library facilities are adequate. These facilities aid in accomplishing the program’s educational objectives and provide an atmosphere conducive to learning.

The classrooms, laboratories and associated equipment are adequate and promote faculty-student interaction. The computing infrastructures are in place to support the instructional and scholarly activities of students and faculty.

7.10 Program Goals
Each program shall have current short and long-range goals, and plans for achieving these goals.

Working with the Department, College and University the Industrial Technology program has developed short and long-term goals. A discussion of expectations from the Dean, a Strengths, Weakness, Opportunities, Threats (SWOT) analysis by the Department and development of a Strategic Plan are discussed below.
Background Information

In May 2011, Dr. Keith Mew, Acting Chair of the Department of Technology, received a set of expectations from the Dean of the College of Engineering, Computer Science, and Technology outlining what he expected from the department for 2011-2012. The Dean requested that the Department:

1. Develop a Strategic Plan that reflects the College and University strategic plans.
2. Continue to integrate and partner the Department of Technology with other departments in the College where there is a fit (education, research, and service).
3. Develop stronger research and development collaborations and increase external funding to support graduate and undergraduate students from industry and government.
4. Successfully complete ATMAE accreditation documentation for a potential 2012 visit.
5. Improve outreach activity to the community colleges and develop successful transfer and transition opportunities for students to improve graduation and retention rates.
6. Build a collegial environment of teacher-scholars who continue to view their roles as mentors to our students.

Over the next 12 months, the Department went through a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis process followed by the development of a new Strategic Plan for the department.

Department of Technology Five-Year Strategic Plan, spring 2012

During spring 2012, the Technology faculty performed a SWOT analysis to lay the foundation for a strategic plan. To address strengths, weaknesses, opportunities and threats, a series of action items were identified for each of the identified items. A copy of the SWOT analysis will be available in the Appendices on the SharePoint server for review.

Student Enrollment, Recruitment, Retention and Advisement

Recruitment of new students along with good advisement and retention efforts has always been important. The Department of Technology has been involved in a variety of off campus and on campus related recruitment effort including University and College events. As a result, enrollment in the Department of Technology has increased by 23% over the past five years. The fall census headcount for the four baccalaureate programs in the Department of Technology is shown below in Table 7.10.1.
Table 7.10.1 Student Enrollment

<table>
<thead>
<tr>
<th>Program</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<td>48</td>
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<td>Fire Protection</td>
<td>97</td>
<td>94</td>
<td>119</td>
<td>125</td>
<td>138</td>
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</tr>
<tr>
<td>Graphic Communications</td>
<td>10</td>
<td>12</td>
<td>19</td>
<td>15</td>
<td>21</td>
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<td>Industrial Technology</td>
<td>109</td>
<td>102</td>
<td>85</td>
<td>69</td>
<td>98</td>
<td>97</td>
</tr>
<tr>
<td>Total</td>
<td>257</td>
<td>244</td>
<td>271</td>
<td>266</td>
<td>317</td>
<td>348</td>
</tr>
</tbody>
</table>

The enrollment numbers reflect concerted efforts made by all department faculty to participate in outreach efforts at feeder colleges and high schools. Most of the effort has been directed at community colleges, since Department of Technology programs have been designed as 2+2 programs.

We want to increase the number of undergraduate students to meet enrollment targets consistent with ECST priorities by implementing the following strategies:

1. Improve recruitment strategies
   a. Open House lab tours and presentations
   b. High School and Community College Visitations – student and faculty presentations
   c. Annual Teacher/Counselor Workshops
   d. Prospective student communications – e-mail lists, web pages, brochures

2. Improve retention strategies
   a. Advisement Workshops for all beginning Tech 1xx and 3xx classes
   b. Use Moodle and Mediasite as a retention tool

3. Improve advisement
   a. Advisement Workshops for all beginning Tech 1xx and 3xx classes
   b. Create advisement FAQs on program websites
   c. The Department secretary will expand her duties to assist with advising.

Short and Long-Term Goals

Table 7.10.2 below lists sets of goals related to the Industrial Technology program in preparation for this self-study. These goals will be shared with our IAB members on March 26, 2013.
### GOALS OF THE DEPARTMENT OF TECHNOLOGY

<table>
<thead>
<tr>
<th>LONG-TERM GOALS (3-5 YEARS)</th>
<th>SHORT-TERM GOALS (1-2 YEARS)</th>
<th>PLANS TO ACHIEVE GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Update current curriculum to reflect current industrial trends and requirements</td>
<td>1. Improve program structure and course sequencing</td>
<td>1. Meet with IAB to review ATMAE Accreditation findings related to program structure and course sequencing</td>
</tr>
<tr>
<td></td>
<td>2. Change the name of the program</td>
<td>2. Research business\industry trends and requirements</td>
</tr>
<tr>
<td></td>
<td>3. Change CSU CIP Code from Industrial Arts to Engineering Technology - General</td>
<td>3. Consult with business\industry experts on educational needs of employees and trends</td>
</tr>
<tr>
<td></td>
<td>4. Address K-factor issue for all lab/lecture courses</td>
<td>4. Research on-campus programs\courses available in all Colleges and meet with representatives to exchange ideas and finding from items 1-3 above</td>
</tr>
<tr>
<td></td>
<td>5. Submit a Program Modification Package to Undergraduate Studies</td>
<td>5. Prepare a draft program curricular model and solicit input and feedback from business\industry experts</td>
</tr>
<tr>
<td></td>
<td>1. Meet with IAB to review ATMAE Accreditation findings related to program structure and course sequencing</td>
<td>6. Share curricular model with community college partners (existing and new) for input and feedback</td>
</tr>
<tr>
<td></td>
<td>2. Research business\industry trends and requirements</td>
<td>7. Explore which courses could be taught using all web-based delivery</td>
</tr>
<tr>
<td></td>
<td>3. Consult with business\industry experts on educational needs of employees and trends</td>
<td>8. Prepare Program Modification package, new and course modification proposals</td>
</tr>
<tr>
<td></td>
<td>4. Research on-campus programs\courses available in all Colleges and meet with representatives to exchange ideas and finding from items 1-3 above</td>
<td>9. Submit Program Modification package to the College Instructional Affairs Committee (IAC)</td>
</tr>
<tr>
<td></td>
<td>5. Prepare a draft program curricular model and solicit input and feedback from business\industry experts</td>
<td>10. College of ECST prepares package for consultation process</td>
</tr>
<tr>
<td></td>
<td>6. Share curricular model with community college partners (existing and new) for input and feedback</td>
<td>11. Meet with parties requiring consultation</td>
</tr>
<tr>
<td>b. Increase the number of students in the major.</td>
<td>1. Expand the number of community college block articulations on Assist.org</td>
<td>1. Meet with community college programs and articulation officers to prepare block articulations</td>
</tr>
<tr>
<td></td>
<td>2. Increase number of community college transfer students</td>
<td>2. Department receives a block articulation requests from Undergraduate Studies for approval</td>
</tr>
<tr>
<td></td>
<td>3. Develop new resources of funding for recruitment</td>
<td>3. Undergraduate Studies updates articulation on Assist.org for the specifying courses as block and ENGL 102 and Math 104, Phys156/Chem 151 prereqs.</td>
</tr>
<tr>
<td></td>
<td>4. Better utilize University, College, and Department web sites and incorporate more social media</td>
<td>4. Industrial Technology faculty reps to meet with Community College Transfer Counselors, grant writers and Articulation officer to promote the new 2+2 pathway</td>
</tr>
<tr>
<td></td>
<td>5. Work with community college on writing grants that assist students in</td>
<td>5. Work with community college on writing grants that assist students in</td>
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</tbody>
</table>
### GOALS OF THE DEPARTMENT OF TECHNOLOGY

<table>
<thead>
<tr>
<th>LONG-TERM GOALS (3-5 YEARS)</th>
<th>SHORT-TERM GOALS (1-2 YEARS)</th>
<th>PLANS TO ACHIEVE GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Continuously upgrade classroom instruction and laboratory equipment to be in phase with technological developments</td>
<td>1. Expand the use of Moodle LMS for instruction, student feedback and determining whether course outcomes have been met</td>
<td>transferring to a four-year program and provide staff, funding and resources</td>
</tr>
<tr>
<td></td>
<td>2. Consult with Industrial Advisory Board to identify laboratory equipment needs</td>
<td>6. Continue to work within University and College of ECST mechanisms for recruitment (Admissions, VIP Day, Boeing Day, bringing groups of students to campus)</td>
</tr>
<tr>
<td></td>
<td>3. Seek assistance from the university, state, and federal funding agencies, and industrial donations for procurement of state-of-the-art equipment for laboratories</td>
<td>7. Work with the College and IAB to find resources to hire professional web developers and social media experts</td>
</tr>
<tr>
<td></td>
<td>4. Begin migrating Graphics-related software to Cloud-based solutions for collaboration and team</td>
<td></td>
</tr>
<tr>
<td>d. Enhance professional relationship between students and area industries</td>
<td>1. Encourage and support student involvement in industrial consulting activities with faculty via the SBDC in the College of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Work with faculty the IAB, business and industry liaisons (College of ECST SBDC) in soliciting projects for TECH 495 – Industry Practicum, Independent Studies, and Internships</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Solicit projects from business\industry to be completed by students as part</td>
<td></td>
</tr>
</tbody>
</table>

#### GOALS OF THE DEPARTMENT OF TECHNOLOGY

<table>
<thead>
<tr>
<th>GOALS OF THE DEPARTMENT OF TECHNOLOGY</th>
<th>PLANS TO ACHIEVE GOALS</th>
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<tbody>
<tr>
<td>LONG-TERM GOALS (3-5 YEARS)</td>
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<tr>
<td>SHORT-TERM GOALS (1-2 YEARS)</td>
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<tr>
<td>PLANS TO ACHIEVE GOALS</td>
<td></td>
</tr>
<tr>
<td>transferring to a four-year program and provide staff, funding and resources</td>
<td></td>
</tr>
<tr>
<td>6. Continue to work within University and College of ECST mechanisms for recruitment (Admissions, VIP Day, Boeing Day, bringing groups of students to campus)</td>
<td></td>
</tr>
<tr>
<td>7. Work with the College and IAB to find resources to hire professional web developers and social media experts</td>
<td></td>
</tr>
<tr>
<td>1. Meet with IAB to review ATMAE Accreditation findings related to Facilities, Equipment and Technical Support</td>
<td></td>
</tr>
<tr>
<td>2. Attend and participate in the Center for Effective Teaching (CETL) sponsored Moodle and Respondus workshops. (Focus on forums, Wikis, collaborative activities, quiz/test building and assessment)</td>
<td></td>
</tr>
<tr>
<td>3. Use College of ECST inventory and evaluate equipment in all labs related to Concentrations within the major. Develop an equipment plan</td>
<td></td>
</tr>
<tr>
<td>4. Research business\industry equipment trends and requirements</td>
<td></td>
</tr>
<tr>
<td>5. Continue to work with the College of ECST and Information Technology Services (ITS) for refreshing baseline computers and maintaining annual software licenses</td>
<td></td>
</tr>
<tr>
<td>6. Work with IAB to assist in the acquisition of laboratory equipment with funding support, equipment loans</td>
<td></td>
</tr>
<tr>
<td>7. Continue to write NSF and DOE grants for funding. Work with our partners the California Fuel Cell Partnership, California Air Resources Board (ARB), SCAQMD etc. to collaborate on federal and state funding initiatives to upgrade the Hydrogen Fueling and Research Center</td>
<td></td>
</tr>
<tr>
<td>8. Collaborate with other departments on campus in writing equipment-related grants</td>
<td></td>
</tr>
</tbody>
</table>
### GOALS OF THE DEPARTMENT OF TECHNOLOGY

<table>
<thead>
<tr>
<th>LONG-TERM GOALS (3-5 YEARS)</th>
<th>SHORT-TERM GOALS (1-2 YEARS)</th>
<th>PLANS TO ACHIEVE GOALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECST.</td>
<td>1. Conduct a study of business and industry needs</td>
<td>1. Disseminate program information to area business and industry personnel</td>
</tr>
<tr>
<td></td>
<td>2. Program information to be available to employees via HR departments, company email blasts, social media</td>
<td>2. Schedule open houses and information sessions to advertise programs</td>
</tr>
<tr>
<td>e. Increase the number of business and industry personnel enrolled in program in our service area</td>
<td>3. Contact and invite HR departments</td>
<td>3. Contact and invite HR departments</td>
</tr>
<tr>
<td></td>
<td>4. Develop liaisons using our graduates</td>
<td>4. Develop liaisons using our graduates</td>
</tr>
<tr>
<td></td>
<td>5. Disseminate program information via List Serves for professional organizations such as SAE, SME, ASEE, ASQ</td>
<td>5. Disseminate program information via List Serves for professional organizations such as SAE, SME, ASEE, ASQ</td>
</tr>
<tr>
<td></td>
<td>of classroom projects</td>
<td>3. Work with local industries and businesses to increase quality internship sites for students</td>
</tr>
<tr>
<td></td>
<td>3. Work with local industries and businesses to increase quality internship sites for students</td>
<td>4. Work with Industrial Technology alumni in industry to serve as classroom speakers, provide tours of their industry/business, serve on as members on the IAB, provide internships</td>
</tr>
<tr>
<td></td>
<td>4. Work with Industrial Technology alumni in industry to serve as classroom speakers, provide tours of their industry/business, serve on as members on the IAB, provide internships</td>
<td>5. Participate with the Career Center in co-sponsoring industry related events and workshops on campus for Industrial Technology majors</td>
</tr>
<tr>
<td></td>
<td>5. Participate with the Career Center in co-sponsoring industry related events and workshops on campus for Industrial Technology majors</td>
<td></td>
</tr>
</tbody>
</table>
Evidence shall be presented showing the adequacy of instruction including: (a) motivation and program advising of students; (b) scheduling of instruction; (c) quality of instruction; (d) observance of safety standards; (e) availability of resource materials; (f) teaching and measurement of competencies (specific measurable competencies shall be identified for each course along with the assessment measures used to determine student mastery of the competencies); (g) supervision of instruction; and (h) placement services available to graduates.

Management and/or technical course syllabi must be presented which clearly describe appropriate course objectives, content, references utilized, student activities, and evaluation criteria. Representative examples of student’s management and/or technical graded work shall be available for each course.

A. Motivation and Program Advising of Students

The primary online degree advisement and audit system at Cal State L.A. is called the Golden Eagle Territory Student Administration (GET/SA). Behind the front end of GET/SA is PeopleSoft/Oracle. Students and faculty access GET/SA via the mycsula.calstatela.edu portal.

The Golden Eagle Territory has been used as an advisement tool since 2005 and the Department of Technology has been very involved in its deployment across the University. During fall quarter 2005, Dr. Seaman attended one of the first training sessions sponsored by Chuck Mancillas, Graduation Supervisor on Golden Eagle Territory Student Administration (GET SA). The training session was conducted in the College of Engineering, Computer Science, and Technology and covered how the new system would be used for general education and major advisement and for processing graduation checks.

Dr. Seaman became one of two trainers university-wide for faculty, chairs, deans and staff. He trained them on the basics and advanced use of PeopleSoft 8.9 (GET SA) from fall 2008 to winter 2010. His activities were sponsored by the Office of Undergraduate Studies and University Academic Advisement Center. He later served as a faculty tester for interactive Degree Progress Report for PeopleSoft 8.9 (GET SA) during summer quarter 2010 and has provided workshops for new faculty members sponsored by the Center for Effective Teaching and Learning (CETL) during fall 2012.
Academic Advising

Admitted freshmen and transfer students, the Department Chair, and program primary advisors all attend university new student orientation where students learn about lower and upper division general education requirements, degree major requirements, course prerequisites, laboratory access, ECST-related student organizations, and the advising process. Students are given information about the program requirements, which is also posted in the online university catalog and the Department website.

For a comprehensive overview of higher education, every student is required to take either TECH 150 “Introduction to Higher Education in Technology” (first-time freshmen), or TECH 301 “Transition to CSULA for Technology Majors” (transfer students) within the first two quarters. Topics covered include: University rules and regulations, general education requirements, major requirements, evaluation of transfer units, sample quarterly planners, individualized quarterly planners, and graduation checks. Each student is required to present an individualized quarterly planner, and get feedback from the instructor. At the end of the course, students complete a self-evaluation and formulate a quarterly planner to complete all the remaining requirements.

Student advising is facilitated in a number of ways:

- **In person:** Advising office hours are posted in the Department office every quarter for advisors and the department chair. Students meet with their primary faculty advisor to evaluate coursework to date, to discuss any issues impacting their present load, to resolve any GPA issues, and to plan subsequent classes. The advisor and student review the student’s degree progress via their Academic Advisement Report using the Golden Eagle Territory – Student Administration (GET/SA).

- **Email:** Students can get clarification from their advisor or department staff concerning particular queries. Email is heavily used by students who find it difficult to meet with an advisor (due to work and other conflicts), to plan their next quarter's class load or when they need immediate clarification on an advisement issue.

- **TECH 310 The Design Process.** Dr. Seaman, the primary advisor for the Industrial Technology program, teaches TECH 310 wherein general advisement is conducted in class every fall quarter. All students are given information on university and general education requirements, major requirements and filing deadlines for graduation checks. Students are required to run their Academic Advisement Report in GET/SA to become more aware of their progress. These activities are helpful for both new and continuing students. Dr. Seaman meets with students individually and during class sessions to answer questions. During fall 2012, thirty-two students received this type of advisement session.
• **CECST Advisement Center.** Students can also get general advisement from the College advisement staff, as they are very knowledgeable about course prerequisites, curricular requirements, course scheduling, and University regulations. Advisement staff has access to GET/SA. Ms. Lily Hwang-Alonzo, an advisor the College advisement office, previously worked in the Department of Technology Advisement office and she is knowledgeable about all program and general education requirements.

The College Advisement Center provides an array of services to incoming freshman and sophomore students in all majors. In addition to academic advisement through professional staff and peer advisors, their services include the engagement of freshman in learning communities, academic excellence workshops, and assistance with scholarship and internship opportunities.

Students are encouraged to seek the advice of any faculty in evaluating career choices. Students get information regarding career choices from job fairs (conducted by the College as a part of ‘ECST Week’ activities, and a few times each year by the University Career Center), and guest speakers (conducted by ECST student organizations such as the Society of Automotive Engineers).

An Academic Advising Process Map was developed for the Department of Technology back in 2007 as part of a University and College imitative to improve the advisement process from beginning to end. The stages of the advisement processes, shown in Figure 7.11.1, below have been updated to reflect current terminology and the use of the GET/SA system.

![Figure 7.11.1 Academic Advising Process](image-url)
Orientation and Advisement Procedures

I. College Orientation
   COLLEGE PERSONNEL 🔴 STUDENT INTERACTION
   - Message from the Dean
   - College Advisement Center

II. Department Orientation
    DEPARTMENT ADVISOR 🔵 STUDENT INTERACTION

Department Advisement Office:
   - Obtains names and CIN to prepare individual folders for new students
   - Provides copies of major program plan and University GE requirements
   - Arrange advisors (AVAD, FPAT, GRAF, ITEC) to meet with students
   - Brings students to their advisors and/or meet with chair for advisement
   - LD GE requirements for first-time freshmen and transfer students
   - Reviews University requirements for IHE, ENGL 102, WPE and UD theme
   - Evaluate math and English placement level (based on ELM, EPT, SAT)
   - Determine first quarter schedule and stress regular quarterly advisement
   - Mandate IHE (TECH 150 and 301) no later than second quarter of attendance at CSULA as required (University Catalog)

III. IHE TECH 150 and 301
     DEPARTMENT ADVISOR 🔵 STUDENT INTERACTION
     - Department Mission and Vision
     - Student Learning Outcomes
     - Web resources
     - University regulations
       o Probation, disqualification, reinstatement and readmission, academic renewal, GPA
       o Forms: Add/drop, incomplete, course overload, graduation checks, general academic petition
       o ENGL 102, IHE, WPE, and diversity requirements (2)
     - GE requirements and transfer evaluations
       o Lower and upper division, block/complete certification (GE-F), diversity requirements
       o Process GE substitutions for non-articulated courses
         ▪ Interact with department offering the GE course and process petitions with supporting documents
- Send petitions to Undergraduate Studies office
- Major requirements and transfer evaluation
  - Lower and upper division electives
  - Process major course substitutions for non-articulated course (XFER TC)
    - Send paper substitution petitions (MA INTS program only) to Records Graduation office
    - Generate electronic course subs in GET/SA for AVAD, FPAT, GRAF and ITEC programs
- Generate initial Academic Advisement Reports for first-time freshmen and transfer students
- Develop degree plan, including timeframe for graduation
  - Student presentation of quarterly planner toward degree completion
  - Advisor provides initial preliminary review of degree plan and recommendations

IV. Regular advising
DEPARTMENT ADVISOR STUDENT INTERACTION
- Clarifications
  - GE
  - Major
  - Transfer credit
    - Process substitutions and course credit restoration
- Regenerate Academic Advisement Reports
- Review student quarterly planners

V. Mandatory Advising
DEPARTMENT ADVISOR STUDENT INTERACTION
- Reinstatement/readmission (probation/disqualification)
- Financial aid academic degree plan (first level petition)
- Petition to waive or substitute a University requirement
- Academic renewal
- Course overload (18 unites/quarter) with minimum 3.0 GPA
- Change of major and/or dual major
- Referral to other resources, e.g., Counseling Center, Office for Students with Disabilities, Career Center, Tutorial Center
- Regenerate report ADVIP (advisement transcript)
- Review student quarterly planners
- File application for graduation once a minimum of 135 quarter units is earned, or at least two quarters in advance (University Catalog, page 113)
VI. Situation Specific Advising
DEPARTMENT ADVISOR STUDENT INTERACTION
- Change of major, or dual major
- Course substitutions
- Academic renewal
- Leave of absence petition
- Writing letters for scholarship applications and job hunting
- Graduate studies requirement information

VII. Graduation Check Advising
DEPARTMENT ADVISOR STUDENT INTERACTION
- Complete graduation application and bachelor degree worksheet; and collect other supporting documents (major/minor course subs, academic renewals)
- Regenerate Academic Advisement Reports
  - Update catalog year if student followed a more recent program
  - Input advisor-approved electives
  - Process GET major substitutions
- Send graduation application with supporting documents to the Graduation Office
- Conduct Senior Survey for major via: [http://csns.calstatela.edu/department/tech/survey/current](http://csns.calstatela.edu/department/tech/survey/current)
- Discuss career opportunities and graduate school
- Resolve discrepancy between advisor’s Academic Advisement Reports and Graduation Office review no. one.
Senior Survey – Rating of Satisfaction with Help from Academic Advisor

Evaluation of advisement is a component of the Senior Survey given to those Industrial Technology majors who apply for a graduation check. This process was implemented for all applicants planning to graduate in 2012. Each student when meeting with the advisor to complete the required paperwork is asked to participate in the Senior Survey. Survey question number nine solicits feedback on advising with this statement: “I am satisfied with the help provided by the Academic Advisor(s).” Students were asked to respond regarding how they agree with the statement using a five-point scale.

5 = Strongly Agree  
4 = Agree  
3 = Somewhat Agree/Disagree  
2 = Disagree  
1 = Strongly Disagree

Twenty students participated in the survey for 2012 with an average rating of 4.65/5.0. Seventeen students have participated in the survey for 2013, with an average rating of 4.94/5.0.

Alumni Survey – Rating of Satisfaction with Academic Advisement

As part of our Alumni Survey for those students who graduated between 2007 and 2011, alums were asked to rate their perception of academic advisement provided by Industrial Technology faculty. Forty-two responses were received to the alumni survey with the results shown in Figure 7.11.2 indicating that the majority of responses rate academic advisement for their major above average to excellent.

![Figure 7.11.2: Rating of Academic Advising by Alumni](image)
Credit in Lieu of Courses

There are two ways for a student to establish credit in lieu of courses.

1. Credit by Exam.

   Students can request a “Credit by Exam” to show competency and get course credit. In the Department of Technology, this process is very rare and is only allowed if the advisor is relatively certain that the student is competent in the material in beginning lower division Technology courses. The student is given a comprehensive exam covering the course material and the grade is recorded on the GET/SA system.

2. College Board Advanced Placement (AP) Program.

   Credit is granted for successful completion of examinations of the Advanced Placement Program of the College Board. Students who present scores of three or better are granted nine quarter units of credit for each examination. The appropriate academic department, division and school determines acceptance of Advanced Placement units for credit towards certain courses. A list of AP examinations for which course credit is awarded is available in the admissions section of the catalog [http://ecatalog.calstatela.edu/](http://ecatalog.calstatela.edu/).

Graduation Requirements

Applying for Graduation - Academic Requirements Report in GET

Certifying that a student has met all graduation requirements, and therefore has complied with university, general education and major requirements, is a simple but functional process as described below:

1. Students initiate this process by filling out an Application for Graduation (degree check). This application is to be filed two quarters prior to the end of the term of their expected graduation. The Academic Requirements Report (an audit report generated on GET/SA) gives a clear picture of the required requirements; completed requirements; transfer credits etc. as shown in Figure 7.11.3 on the next page. Students thus have a general idea of the graduating quarter and discuss the program requirements with the advisor.

2. Students submit their completed application to the Department via their primary advisor for processing. The undergraduate faculty advisor discusses the Academic Advisement Report with the student. The report indicates clearly all the requirements that have been completed and flags the remaining requirements. Figure 7.11.4 on the next page shows an example of how degree audit icons (diamond meaning in progress) are used to flag remaining requirements in the degree audit. The student and advisor then draw up a plan to meet the remaining requirements in the coming two quarters.

3. The primary advisor updates any information (course substitutions, general education petitions, AP scores etc.) for the student for currency in GET/SA. This allows the staff in the Graduation Office to check on the student’s remaining requirements in the coming quarters. The Department staff then forwards the graduation application to the Graduation Office for an official degree audit.
4. The Graduation Office of the University Registrar's Office has the sole authority to audit and certify that a candidate for graduation has fulfilled her/his approved program requirements. Graduation check audit results are sent by U.S. mail to the students prior to their final anticipated quarter. Students who are enrolled in the quarter they expect to graduate but do not complete all degree requirements will have their graduation application extended to the next quarter.

The Graduation Office representative who processes graduation checks for the College of Engineering, Computer Science, and Technology is Ms. Tanesha Collier. She works closely with advisors including Dr. Seaman, primary advisor for the Industrial Technology program. We also work closely with Gabriel Reyes, the Graduation Supervisor. Mr. Reyes is very familiar with the Industrial Technology program because he is an alumnus of the program.
5. Students who do not finish the requirements as planned must reapply and restart the graduation application procedure.

6. Degree dates are posted at the end of the quarter in which all requirements are met. On completion of the degree requirements, the transcripts on GET/SA indicate the following:

   Degree: Bachelor of Science
   Degree Date: xx-xx-20xx
   Academic Plan: Industrial Technology
An example of a student degree posting is shown below in Figure 7.11.5.

![Image of a student degree posting](CalStateLA_degree_award.png)

**Figure 7.11.5: Degree Awarded on GET/SA**

7. After the degree is posted on GET/SA, students are provided with a letter of congratulations from the Graduation Office and their diploma is mailed within a month or two.

**Scheduling of Instruction**

Course scheduling for the College of Engineering, Computer Science, and Technology is coordinated by the Associate Dean’s office. The Department of Technology Administrative Support Coordinator and the Department Chair of Technology, working with the Associate Dean’s office, consults with faculty members concerning the prospective schedule. This process originates from the prior academic year as the Department of Technology plans an annual set of courses to offer the following year. During the past few years, the process has been led by Dr. Mauricio Castillo, who guides the faculty through the process in creating a matrix of course offerings for all four quarters of the academic year. He has also provided leadership in updating our two-year and four-year academic roadmaps tied to this scheduling effort.
This detailed process includes reviewing course offerings and enrollments from previous academic years, working with the College Advisement Center staff to coordinate day and time slots and increase service course offerings for first-time freshmen engineering students who are enrolled in course such as: TECH 110 Introduction to Drafting, TECH 150/301- Introduction to Higher Education courses, and the General Education Block E, TECH 250 - Impact of Technology on the Individual and Society.

Because of this new course planning process, the Department of Technology has seen improvements in a number of areas including:

- reduction of the number of courses being cancelled
- reduction of the number of course conflicts within the major and other departments in the college
- better coordination of computer laboratory access, increased offerings of service courses in the College
- higher full-time equivalent ratios for the department
- higher student : faculty ratios more in line with the University

**Phased Student Registration**

A student is considered a full-time student when enrolled in a minimum of 12 quarter units. Each student has a limit of no more than 18 units per quarter. Due to the budget situation and increased student population on campus, reaching that target now involves a phased registration process to make sure that students at all grade levels have a chance to register for classes. Phase I of the registration process is now capped at a limit of 16 units. Students and advisors work together to optimize getting those hard-to-get classes while sticking to the 16-unit cap. Phase II registration begins in week 10 of the quarter, allowing students to add a maximum of 18 units. Students are made aware of the start date of their Phase I registration period within the GET/SA system.

The scheduling of activities for each class is the sole responsibility of the instructor. The time allocated to lecture, discussion, recitation, and laboratory-related activities has been organized to meet the student learning outcomes with the allotted time for each class. For most lecture/laboratory classes, the laboratory-related assignments are planned to give students time to complete them within the lab portion of the class. This is because students need to use the equipment, computers and software that may only be available during the scheduled class/laboratory time.
Industrial Technology courses vary in unit offering. Courses within the program are two, three and four-unit offerings. Two-unit courses include TECH 150, 301 and 305. Three and four-unit course offerings differ depending whether they are lecture or lecture/lab courses. A three-unit lecture/lab course has 1.5 hours of lecture and 4.5 hours of laboratory. The only four-unit lecture/lab course, TECH 495, has 2.5 hours of lecture and 4.5 hours of laboratory.

**Students’ Perception of Quality of Instruction**

The Department of Technology’s Student Opinion Survey of instruction is shown in Table 7.11.1. The survey is comprised of two parts. Part A offers 11 standard questions below with a scale of zero to five.

The scale used for these opinion surveys are:

<table>
<thead>
<tr>
<th>STUDENT OPINION SURVEY STATEMENTS</th>
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<tbody>
<tr>
<td>1. The course syllabus clearly stated course objectives, requirements and grading criteria</td>
</tr>
<tr>
<td>2. The readings and assignments contributed to my understanding of the subject</td>
</tr>
<tr>
<td>3. Exams, projects, papers, etc. were good measures of the course material</td>
</tr>
<tr>
<td>4. The instructor provided timely feedback about my performance in class</td>
</tr>
<tr>
<td>5. The instructor clearly presented the subject matter</td>
</tr>
<tr>
<td>6. The instructor was well prepared</td>
</tr>
<tr>
<td>7. The instructor demonstrated knowledge of the subject matter</td>
</tr>
<tr>
<td>8. The instructor was accessible to provide requested help in the subject</td>
</tr>
<tr>
<td>9. The instructor was respectful and unbiased when interacting with students</td>
</tr>
<tr>
<td>10. The course contributed to my intellectual growth and/or helped me develop useful skills</td>
</tr>
<tr>
<td>11. Overall, the instructor was an effective teacher.</td>
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</table>

Part B of the Student Opinion Survey allows students to provide written feedback. Comments related to course content, method of presentation, materials, assignments, and or any other area of instructional performance are encouraged.
Table 7.11.1 Student Opinion Survey Standard Statements

<table>
<thead>
<tr>
<th>Student Opinion Survey Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The course syllabus clearly stated course objectives, requirements and grading criteria</td>
</tr>
<tr>
<td>2. The readings and assignments contributed to my understanding of the subject</td>
</tr>
<tr>
<td>3. Exams, projects, papers, etc. were good measures of the course material</td>
</tr>
<tr>
<td>4. The instructor provided timely feedback about my performance in class</td>
</tr>
<tr>
<td>5. The instructor clearly presented the subject matter</td>
</tr>
<tr>
<td>6. The instructor was well prepared</td>
</tr>
<tr>
<td>7. The instructor demonstrated knowledge of the subject matter</td>
</tr>
<tr>
<td>8. The instructor was accessible to provide requested help in the subject</td>
</tr>
<tr>
<td>9. The instructor was respectful and unbiased when interacting with students</td>
</tr>
<tr>
<td>10. The course contributed to my intellectual growth and/or helped me develop useful skills</td>
</tr>
<tr>
<td>11. Overall, the instructor was an effective teacher.</td>
</tr>
</tbody>
</table>

Observance of Safety Standards

Laboratory safety related to instruction in the Industrial Technology program is of utmost importance. The ability to recognize safe practices, unsafe working conditions in the workplace and have knowledge of OSHA standards is important to our educational mission of preparing our graduates. Students in the Industrial Technology program who take lecture/laboratory classes that involve working with equipment in the lab are not allowed to operate the equipment until they have received proper instruction through lecture in the class about the hazards of operating equipment. At the very beginning of each quarter, faculty review safety information with the students, including required protection measures, and they demonstrate safe use of the equipment and processes. After covering safety information and demonstration of proper operating procedure of equipment, students are given a safety test, which they must pass before being allowed to use equipment in the lab. Faculty are required to be in the laboratory at all times to supervise students engaged in using equipment during lab hours.

All Industrial Technology majors are required to enroll in TECH 101 Industrial Safety which is a three-unit lecture class. TECH 101 is the first course in the Required Core focusing upon the nature, background, importance, and needs in industrial safety. Major emphasis is placed on regulatory aspects of industrial safety; identification and controlling safety hazards; accident and injury analysis; development of safety goals; material handling, and fire prevention and protection.
Student learning outcomes for the course include:

- Examine the duties and responsibilities of the technical supervisor with respect to safety programs, with particular emphasis on developing checklists for self-inspections of the workplace.
- Recognize that accidents are the result of identifiable causes and to learn the necessary elements of safety programs designed to eliminate or minimize safety and health hazards.
- Recognize the need for safety and health programs in government, business, and industry.
- Ascertain the effects of OSHA on the activities of employers and employees, and to provide mechanism for precautions that should be taken.
- Understand the background of the OSHA, the organization created to administer the act, and the role of the states in safety and health.
- Learn recordkeeping and other requirements prescribed by the OSHA, how safety and health standards and regulations are developed and promulgated, how provisions of the act are enforced, and an employer’s rights with respect to appeal and variances.
- Learn the types of accident investigation and reporting.

Topics covered in Industrial Safety during the course include the following:

- Hazard Communication Program
- Blood borne Pathogens Program
- Respiratory Protection
- Hearing Conservation
- Confined Space
- Fire Prevention Program
- Job Hazard Analysis
- Hand Tool Safety Program
- Power Tool Safety Program
- Accident Investigation Program
- Process Safety Program
- Welding Safety Program
- Compressed Gas Safety Program
- Fall Protection Program
- Trenching, Shoring and Excavation
- Safe Chemical Handling
- Safety Program Development
- Safety Recognition for Supervisors
- Spill Prevention and Control
- Machine Guarding Safety Program
- Hazardous Materials Incident Command
- Electrical Safety
- Radiation Safety
- Cancer Causing Chemicals
- Effective Employee Communication
- Contractor Safety for Supervisors
- Industrial Toxicology
- Risk Management Overview for Supervisors
Availability of Resource Materials

Faculty members who teach courses in the Industrial Technology program use supplemental instructional resource materials. These supplemental resources include digital video disks (DVDs), YouTube videos, periodicals, instruction software, tutorial activities and other resources from the World Wide Web. These resource materials can be found in course information files, Moodle sites and course syllabi.

Examples of supplemental instructional resource materials used for TECH 250 (Block E General Education) and throughout the Industrial Technology major include:

**Block E: Lifelong Learning**

TECH 250 – Impact of Technology on the Individual and Society
- Moodle 2.3.3 Learning Management System (LMS) to provide access to the syllabus, readings, homework, activities and to collect assignments
- Battle of the X-Planes DVD is shown as part of the study of Technology and the Military

**Foundation Program**

TECH 110 – Introduction to Drafting
- AutoCAD 2012 tutorials via mycsula.calstatela.ed and Lynda.com (LMS)
- SolidWorks 2012 tutorials via www.SolidProfessor.com/weblms/

TECH 144 – Introduction to Industrial Design
- www.idsa.org (Industrial Designers Society of America) website to study the history of products and designers

**Required Core**

TECH 310 – The Design Process
- Toy Excavator Tutorial for CATIA V5 - http://seit.unsw.adfa.edu.au/...

TECH 360 – Modern Manufacturing
- VHS tapes from the Society of Manufacturing Engineering
- YouTube related videos
Industry Track Concentration

TECH 462 – Digital Manufacturing
- CG Tech/Vericut CNC Machining Simulation software - http://cgtech.com/usa/
- DELMIA Manufacturing Simulation for Robotics workcells - http://www.3ds.com/products...

TECH 466 – Computer Aided Manufacturing
- MasterCAM University Online video training - http://www.mastercamu.com/index.html

TECH 467 – Emerging Manufacturing Technologies
- VHS tapes
- Videos provided manufacturers

Teaching and Measurement of Competencies

To better understand the relationship of student learning outcomes to program outcomes and objectives, the faculty who teach classes in the Industrial Technology program began a process of aligning Program Outcomes to individual course Student Learning Outcomes (SLOs). This process started out by adding Program Outcome markers to syllabi containing SLOs for those “Required Core” courses being taught during spring 2012. This process continued with the next set of Required Core classes in fall 2012. The Program Outcomes (referred to as Educational Objectives and Program Outcomes) can be found on the Department of Technology web site at: http://www.calstatela.edu/academic/ecst/tech/itec/ITEC-BS_Learning-Outcomes.pdf

The three educational objectives, knowledge, skills and attitudes, have 19 corresponding program outcomes. In order to better align a program outcome to an individual SLO on a course syllabus, each educational objective and program outcome were shortened. For example, the first program outcome under the knowledge objective is “They will have knowledge of science, math and technical management.”

To align the knowledge program outcome the identifier or marker becomes K1. Faculty members were then asked to align each of the SLOs on their syllabi with appropriate outcome markers. A SLO could potentially align with any or all of the knowledge, skills and attitudes program objectives, as well as individual program outcomes for each objective.
During the first class meeting when discussing the course requirements, faculty discuss the specific SLOs with the students and related them directly to program learning outcomes to make them aware of what is expected in the class. Later in the quarter, they also discuss what is expected when students enter the workforce relative to the course objectives.

An example of how this program outcome/student learning outcome alignment is shown below for TECH 310 – The Design Process, a Required Core class that was taught in fall 2012. The information below is from the TECH 310 syllabus and each of the five SLOs has either one or two program outcomes aligned.

**Student Learning Outcomes and Alignment to Program Outcomes**

*Upon completion of this course, students will be able to:*

1. identify the various stages of the engineering design process [K1]
2. identify and use traditional design tools for formulating an initial design concept for presentation purposes [S2, S3]
3. identify and use appropriate electronic tools in refining ideas in the design process [K4, S7]
4. identify and use industry standards [K1]
5. function as a member of a design team and use electronic collaboration tools [K4, S6]

**Relationship of Required Core Courses to Program Outcomes**

Table 7.11.2 provides a complete list of all Required Core courses taken in the Industrial Technology major contributing to the attainment of the three educational objectives (*knowledge, skills, and attitudes*) and program outcomes. Program outcomes addressed in each of the courses below are indicated. We are still in the process of collecting data which we will review at the end of spring 2013.
### Table 7.11.2 Relationship of Required Courses to Program Outcomes

<table>
<thead>
<tr>
<th>REQUIRED CORE COURSES</th>
<th>EDUCATIONAL OBJECTIVES AND OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>KNOWLEDGE</td>
</tr>
<tr>
<td></td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>TECH 101 Industrial Safety for Industrial Ed.</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 150 Introduction to Higher Education in Technology</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 301 Transition to CSULA for Tech Majors</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 305 Information Literacy</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 310 The Design Process</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 330 Graphics Communication Processes and Materials</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 360 Modern Manufacturing</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 370 Power, Energy and Transportation</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 400 Written Communication Skills for Industrial Technology</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 421 Internetworking</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 488 Fluid Power</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 489 Industrial Training Methods</td>
<td>● ● ● ● ●</td>
</tr>
<tr>
<td>TECH 495 Practicum in Industrial Technology</td>
<td>● ● ● ● ●</td>
</tr>
</tbody>
</table>
Supervision of Instruction

Full-time tenure track and tenured faculty seeking promotion participate in an annual evaluation each year through Cal State L.A.'s Retention, Tenure and Promotion (RTP) process. These policies and procedures along with the CSU/CFA collective bargaining agreement, CSULA Faculty Handbook and College and Departmental documents can be found online at:

Criteria and Procedures for the Evaluation of Faculty

Full-time tenured faculty members are reviewed according to campus policy (no greater than five-year intervals) regarding post-tenure review procedures. The last post-tenure review process for faculty in the Department of Technology occurred in 2011.

Full-time tenure track faculty who are being reviewed through the annual RTP process and tenured faculty going through post-tenure review are required by university policy to have a minimum of one peer observation of teaching prior to submitting their file to the Dean’s office. The Department Chair must arrange for a faculty member to visit the faculty member’s class and provide an evaluation of their instructional performance. The original letter from the classroom visit is required to be placed in the faculty member’s RTP file in the Dean’s office.

All tenured, tenure track and adjunct faculty are required to administer the Student Opinion Survey to allow students in their classes to provide feedback on eleven standard questions on Part A, and ask for written comments in Part B. Each faculty member receives a copy of their individual mean scores along with the department mean scores for comparison. A copy is retained in the department office.

Summary sheets are placed in the respective tenured and tenure track faculty members’ RTP files in the Dean’s office for faculty evaluation processes. The original survey sheets with written comments are returned to the faculty member so that he/she may see the individual ratings for the eleven questions and written comments.

The Department Chair reviews the cumulative results of the Student Opinion Survey for each course taught the previous quarter. If there are any glaring weaknesses evident related to instruction, the Chair can then meet with the individual faculty member to strategize how to improve instruction.

As mentioned previously, policies and procedures can be found in various documents including the recently approved CSU/CFA Collective Bargaining agreement. As a result of the new collective bargaining agreement, all Deans, Chairs and faculty members were notified on December 11, 2012 by the Division of Academic Affairs of a new contract provision related to the administration of student opinion surveys. The new provision will now require all classes taught by faculty to be evaluated each quarter under the new agreement. Previously, all tenured faculty members were required to administer a minimum of two student opinion surveys per year. This policy will be implemented beginning winter quarter 2013.
Center for Effective Teaching and Learning

Cal State L.A. provides support for new and existing faculty members to improve instruction through the Center for Effective Teaching and Learning (CETL). Faculty development includes one-on-one consultations, workshops, brown bag discussions, webinars, and peer mentoring. The center is located in the Fine Arts building and is dedicated to the following principles:

- Promoting best practices to enhance SLOs.
- Developing an institutional model that fosters collaboration and community.
- Encouraging all faculty to explore new pedagogy and best practices.
- Modeling good teaching and learning practice.

The Center for Effective Teaching and Learning has been an excellent resource to faculty in the Department of Technology who are incorporating the Moodle Learning Management (LMS) system into their course and teaching. Faculty members participate in various CETL workshops based on their individual instructional needs.

Placement Services Available to Graduates

California State University, Los Angeles offers career services through its Career Development Center. Services offered include: job preparation workshops, computer programs to assist them with their efforts, online informational flyers and presentations, the On Campus Interview (OCS) program, employer events and opportunities to apply for jobs and internships via Eagle iJobs online service.

Industrial Technology majors are advised to visit with the Career Development Center and Senior-level students are encouraged to register for the On Campus Interview program.

As part of the Senior Survey given when students apply for a graduation check in their senior year, one of the questions on the survey asks if they plan to use the services of the Career Development Center as part of their job search strategy.

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th></th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>14</td>
<td>YES</td>
<td>10</td>
</tr>
<tr>
<td>NO</td>
<td>6</td>
<td>NO</td>
<td>7</td>
</tr>
</tbody>
</table>

Of the 20 Industrial Technology seniors who took the survey for 2012, 14 indicated that they would use the center. So far for 2013, 10 of 17 seniors indicated that they will use the center.

Historically speaking, Industrial Technology majors seeking employment have run into hurdles trying to explain their major to prospective employers unfamiliar with the major. As a result, the program web page for Industrial Technology has a link called Job Titles. When prospective students, current students or employers navigate this link they find out information about job titles and how Industrial Technology majors differ from engineering majors. The information is shown below is a partial list.
Job Titles

Graduates of the Industrial Technology program are called “technologists” to distinguish them from graduates of programs in engineering. Technologists apply management theory and practice with technical skills to solve problems.

Industrial technology graduates find employment as:

- Automation Integration Specialists
- Application Engineers
- Electronic Control Specialists
- Energy Consultants
- Facilities Planners
- Industrial Trainers and Training Managers
- Manufacturing Technologists
- Production/Process Planners
- Quality Assurance Managers
- Technical Sales and Service Engineers
- Technical Support Specialists
- Test/Lab Managers
- Project Managers
- Operations and Supply Chain Manager
- Technical Specialist
- District Managers – Automotive Industry
- Training Managers
- Junior Manufacturing Engineers
- Associate Engineers – Design
- Technical Manager for Quality & Engineering
- Supplier Quality Engineer
- Product Development
7.12 Graduate Satisfaction with Program

Graduate evaluations of the program/option shall be made on a regular basis (two to five years). These evaluations shall include attitudes related to the importance of the general outcomes and specific competencies identified for the program/option. Summary data shall be available for graduate evaluations of the program/option.

A Senior Exit Survey was implemented in 2012 to solicit feedback on their experiences in the program and the importance of program outcomes. Summary data for 2012 and 2013 along with individual comments related to the program are provided below. We have implemented an evaluation process and provided summary data to comply with this standard. Input received will be shared with faculty and members of the Industry Advisory Board, assessed and considered in the department's program improvement program.

Senior Survey Implementation

Historically, all Industrial Technology majors at the time when they apply for graduation as seniors meet with their advisor to fill out the required paperwork and review their academic progress within the GET SA system. This process normally takes place two and a half quarters prior to the quarter they anticipate graduating.

As part of our assessment process to improve our program, we implemented a Senior Survey for the first time for all majors applying for graduation in 2012. Students who applied for a "Graduation Check" anticipation of graduating in one of the quarters in 2012 (fall, winter, spring or summer) were asked to participate and complete the online questionnaire as part of their graduation check process. The Senior Survey continued in 2013 for those students anticipating graduating from the program in winter, spring, and summer quarters. The end date for collecting data for seniors applying for a summer graduation check is February 22, 2013 as per the Graduation Information sheet provided by the University. Additional data will continue to be collected from April 9 to May 9 for those Industrial Technology seniors applying for a fall graduation check. Fall quarter is the last quarter in the data collection cycle for 2013.

The Senior Survey was hosted on the Department of Computer Science’s CSNetwork Services website. To see the 2013 Senior Survey for Industrial Technology majors click here. Students were told that the survey was anonymous and the instruction they would see are shown below.

2013 Survey of Graduating Seniors - B.S. Industrial Technology Program
The purpose of this survey is to help faculty continuously improve the Industrial Technology (ITEC BS) program. Graduating seniors have gained many insights into the strengths of the program and areas where the program might be improved.

Reminder to advisors: Only Senior students who apply for a Graduation Check in 2013 take this survey!
INSTRUCTIONS: There are two sections to this survey. There are 25 items in Section I and 19 items in Section II.

SECTION I:
Questions 1 – 17 - please select the response that best captures your experience in the Industrial Technology program.

1 = Strongly Disagree
2 = Disagree
3 = Somewhat Agree/Disagree
4 = Agree
5 = Strongly Agree

Questions 18 - 25 - these questions provide the opportunity for personal feedback and the option to include information to assist us with surveying employers. After completing Section I, you will be required to complete Section II and provide your input on 19 Student Learning Outcomes related to the Industrial Technology program.

SECTION II:
Section II of the Senior Survey asks the question: How satisfied are you that Cal State L.A. is providing you the following as related to 19 Student Learning Outcomes? Please select the response that best captures your experience in the Industrial Technology program.

Note: if you think the item is Not Applicable (does not apply to you), then do not select any of the choices and simply go on to the next item.

1 = Very Unsatisfied
2 = Unsatisfied
3 = Somewhat Satisfied
4 = Satisfied
5 = Extremely Satisfied

Twenty seniors who applied for a Graduation Check participated in the 2012 Senior Survey. As of 2/21/2013 (winter quarter graduation application deadline), seventeen seniors have taken the 2013 Senior Survey. We anticipate that we will exceed the 20 students as Industrial Technology seniors who intend to graduate in summer of fall of 2013 will be applying for graduation. Results for 2012 and for 2013 are presented below.

Student Satisfaction with Courses, Faculty, and the Program (Section I)
The primary purpose of Section I of the Senior Survey was to assess attitudes and perceptions of Industrial Technology seniors toward faculty, the computer laboratory and software within the College of ECST, course related issues, University resources such as the Library and Career Center and whether they participated as a member of student organization.
They were asked to please select the response that best captured their experience in the Industrial Technology program. The rating scale for the outcomes are:

1 = Strongly Disagree  
2 = Disagree  
3 = Somewhat Agree/Disagree  
4 = Agree  
5 = Strongly Agree

The Knowledge, Skills, and Attitudes headings that are used to categorize the outcomes were not included in the survey design. The result for 2012 and 2013 are provided below in Table 7.12.1. Responses from senior students indicate they are satisfied with courses, faculty and the program.

<table>
<thead>
<tr>
<th>Questions related to Student Satisfaction with Courses, Faculty, and the Program</th>
<th>GRADUATION CHECKS</th>
<th>2012 (20 SENIORS)</th>
<th>2013 (17 SENIORS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty were helpful when I needed assistance.</td>
<td>4.5</td>
<td>5.0</td>
<td>4.82</td>
</tr>
<tr>
<td>Overall, the quality of instruction was excellent in TECH courses.</td>
<td>4.3</td>
<td>5.0</td>
<td>4.29</td>
</tr>
<tr>
<td>I was treated fairly in my dealings with faculty.</td>
<td>4.65</td>
<td>5.0</td>
<td>4.71</td>
</tr>
<tr>
<td>Faculty were experts in their subject matter areas.</td>
<td>4.45</td>
<td>5.0</td>
<td>4.71</td>
</tr>
<tr>
<td>The College of Engineering, Computer Science, and Technology (ECST) computer resources met my needs.</td>
<td>4.45</td>
<td>5.0</td>
<td>4.65</td>
</tr>
<tr>
<td>Overall, I am satisfied with the quality of laboratory equipment.</td>
<td>4.25</td>
<td>4.0</td>
<td>4.24</td>
</tr>
<tr>
<td>Lab hours provided access to equipment to complete assignments.</td>
<td>4.30</td>
<td>4.5</td>
<td>4.71</td>
</tr>
<tr>
<td>I was able to get into TECH courses in a timely manner.</td>
<td>4.10</td>
<td>4.0</td>
<td>4.24</td>
</tr>
<tr>
<td>I am satisfied with the help provided by the Academic Advisor(s).</td>
<td>4.65</td>
<td>5.0</td>
<td>4.94</td>
</tr>
<tr>
<td>My peers were helpful and contributed to my learning.</td>
<td>4.5</td>
<td>5.0</td>
<td>4.35</td>
</tr>
<tr>
<td>I felt comfortable interacting with faculty in my program.</td>
<td>4.75</td>
<td>5.0</td>
<td>4.59</td>
</tr>
<tr>
<td>Being in the Industrial Technology program gave me a sense of belonging on the campus. It made me feel a part of the University.</td>
<td>3.6</td>
<td>4.0</td>
<td>4.24</td>
</tr>
<tr>
<td>My career options have greatly expanded.</td>
<td>4.25</td>
<td>4.0</td>
<td>4.47</td>
</tr>
<tr>
<td>The content of TECH courses was state-of-the-art.</td>
<td>4.05</td>
<td>4.0</td>
<td>4.00</td>
</tr>
<tr>
<td>Overall, I learned a great deal in my TECH classes.</td>
<td>4.4</td>
<td>5.0</td>
<td>4.53</td>
</tr>
<tr>
<td>I would recommend the Industrial Technology program to others.</td>
<td>4.4</td>
<td>5.0</td>
<td>4.53</td>
</tr>
<tr>
<td>The campus library services were adequate.</td>
<td>4.2</td>
<td>4.0</td>
<td>4.47</td>
</tr>
</tbody>
</table>
Additional Student Comments for 2012 and 2013

Q1. Who or what influenced you in deciding to pursue the Industrial Technology program at CSULA?

2012 Responses, by Tracking Number (active link)

4320390
- My high school teacher set me up.

4334287
- Dr. Seaman was a great influence in me pursuing a degree in the technology program. He opened my eyes that I can do so much with the technology degree. It involves so many things that I can pursue later in my future. By been an industrial technology I have the doors open to work with graphics designs, manufacturing, quality management, and with the new technology go green. I started as a mechanical engineer, and all they taught was pure theory. I wanted to actually work with my hands, and experience the new programs. Dr. Seaman is a very helpful advisor, professor, and a great person.

4334335
- The idea of working hands-on and actually developing motor skills as well as computer skills.

4334383
- My main reasoning for attending CSULA is there continued involvement in competitions and the success level. The entire Tech faulty are established individuals in their fields.

4334432
- I came here because this is the only school in my region that offers this degree.

4334535
- Mr. Ligarrara from Mt. SAC. And lack of engineering classes at Cal Poly Pomona.

4336536
- Dr. Virgil Seaman. "An outstanding adviser."

4349919
- 1) College Catalog
- 2) Former students.
- 3) Dr. Seaman

4358221
- Dr. castillo was the faculty that influence me.

4360589
- I want to transfer to the design department at my job.

4365063
- The staff from MEP along with Dr. Castillo and Dr. Seaman influenced me in pursuing a degree in Industrial Technology.

4370118
- The unique learning opportunities allowed me to gain more experiences in subject matter that I was not exposed to before I came to CSULA.
Q1. Who or what influenced you in deciding to pursue the Industrial Technology program at CSULA?

2013 Responses, by Tracking Number (active link)

4391822
- The Industrial Technology program was the next best thing within the realm of the industry that I want to be part of.

4391872
- My professors from Mt. San Antonio College recommended me pursue the Industrial Technology program.

4393532
- I wanted to expand my area of knowledge of technology.

4396337
- Dr. Seaman came to Citrus College in the spring of 2008 and I transferred in the fall of 2011.

4398795
- My former high school teacher influenced me to pursue the Industrial Technology program.

4400414
- My old high school teacher

4400541
- My brother majored in Industrial Technology and I decided to try and see if I enjoyed the program

4401195
- This field is an excellent way to actually supervise the assembly of a wide range of products. My particular interest is the defense industry and the Industrial Technology offers me the opportunity to enter this field as a vital member of a shipyard which where I see myself in the near future.

4404425
- The robust amount of classes made available for pursuing technical job careers.

4404904
- My art teacher at my high school told me to think about industrial design as a major since, I was an AP student in art. I thought the most related major option was industrial technology here at CSULA. It was the best decision I every made and was exactly what I was expecting. Also, my high school advisor told me CSULA had a great engineering and technology program.

4405284
- I earned my associates degree in electronics communication from Los Angeles Trade Technical College. I’ve learned about the 2+2 program which encourage me to look into it. I’ve decided to schedule an appointment with Dr. Seaman to learn more about the Technology program. It was more of a hands on approach, which I preferred.

4405456
- Not to many California Universities offer degrees in Industrial Technology.

4406347
- I heard about the Industrial Technology program when I was at Mt. SAC college. I started to do some research about the program and came to the orientation to see what it was like. I met with Dr. Seaman and I liked what they were teaching.

4425567
- The courses from my 2-year air conditioning and refrigeration program transferred to the Industrial Tech program at CSULA. Two of my colleagues at work also went through the same certificate program and graduated from the Industrial Tech program at CSULA.
Q2. Additional comments about your experiences with the Industrial Technology program at CSULA?

2012 Responses, by Tracking Number (active link):

4334335
• Dealing with canceled classes was a major issue in keeping with my school schedule.

4334383
• The entire Tech faculty are very knowledgeable and willing to put your needs first. Had a great time learning from the faculty here at CSULA.

4360589
• Professors and students were very helpful. Professors were available at any time by email or phone. My peers were there for me when I would struggle with a class. Overall, it was a great experience!

4320390
Overall a positive and enriching experience.

2013 Responses, by Tracking Number (active link):

4391822
• My overall experience was pleasant. All the professors were helpful but I truly believe that the Industrial Technology program needs to be more rigorous. The majority of my courses out of the concentration classes were fairly easy and did not add anything significant to my education at CSULA. This way the program can produce more successful and competent students that can be more marketable once graduation comes around.

4391872
• It was a great experience and the faculty members were very helpful.

4393532
• I learned so much and really helped me gather a better understanding of my major.

4396337
• The industrial tech program aided me into finding a career that would benefit me as a person and catch my interest.

4400414
• need to broadcast to high school tech programs to inform the kids about this program.

4400541
• great community got to know the instructors very well

4401195
• The advisor and faculty offer cutting edge knowledge that keep up with new emerging technologies in the industry itself.

4404904
• I noticed may of my peers in engineering (Mechanical, civil, and Fire admin) decided to switch to the technology program. That gave me a wonderful feeling knowing that many of my peers found this more interesting. I loved the whole engineering building, the computer access lab was essential to me for the fact i did not have much access to a computer and the various software need to complete homework. The program for technology was very small compared to other departments, which allowed myself to know everyone in my major and the professors. The concept of learning the ideas first and applying them to hands on experience made it so interesting and fun to be engaged in the projects.
This program has one of the best advisors, Dr. Seaman, I had the opportunity of interacting with while at CSULA. I strongly feel his understanding of student's specific needs, and his sincere desire to graduate them from the CSULA separates this program from others at the school. Unlike other courses taken at this school, the majority of the courses offered in the Industrial Tech program prepare you with not only theoretical information, but most importantly their focus is on preparing you for real world problems and real world solutions.

I strongly feel that no matter what field you are in, most of the core required courses along with the Industry track courses, provide you with a well-rounded education that allows you to easily adapt into any industrial situation, especially from a management perspective.

There are some areas of the program I feel can be improved:

1) The availability of night courses should be expanded in order to give working students an opportunity to enroll in the classes that are typically only offered in the day.

2) The availability of courses in general should be expanded. Throughout my time at CSULA, many classes were canceled and I ended up taking 1 or no classes in a quarter.

3) I realize the department can only do so much with the budget they were allocated, but I feel that enough classes in the specific concentrations should be offered on a quarterly basis so that a student wanting to focus on a specific concentration can have the opportunity to learn all of the material that was intended to be learned in the specific concentration. Substituting courses between the concentrations is very helpful to help maximize the students' time and money spent on a quarterly basis, but I think the course schedule should be revised to ensure this can possible. A student may end up taking a concentration class in a field that is not in any way related to anything he may ever do, and miss out on the opportunity to learn the material from a course that would have helped him in his specific concentration.

4) Because the industrial program is tailored towards Industrial Management, I think a concentration in management should be offered.

• Being here for almost two years, i've learned a lot coming to this program. I believe it's an excellent program in which should receive greater exposure. Faculty members are very helpful and they want you to succeed.

• I think there should be more classes on machining parts from your own design. Also I would like to see more Industrial design classes.

**Industrial Technology Student Satisfaction (Section II)**

Section II of the Senior Survey asked seniors to rank how satisfied they were with meeting each of the 19 Student Learning Outcomes for the Industrial Technology program. They were asked to please select the response that best captured their experience in the Industrial Technology program. The ranking scale for the outcomes is:

1 = Very Unsatisfied
2 = Unsatisfied
3 = Somewhat Satisfied
4 = Satisfied
5 = Extremely Satisfied.
The Knowledge, Skills, and Attitudes headings that are used to categorize the outcomes were not included in the survey design. A comparison of results for 2012 and 2013 is provided below in Table 7.12.2. Our senior students have indicated that they are satisfied in terms of their experiences while in the program as related to program outcomes.

Table 7.12.2 – Survey, Section II: Industrial Technology Students’ Satisfaction with the 19 Student Learning Outcomes

<table>
<thead>
<tr>
<th>Descriptions of the 19 Student Learning Outcomes Relative to the Educational Objectives</th>
<th>GRADUATION CHECKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012</td>
</tr>
<tr>
<td></td>
<td>(20 SENIORS)</td>
</tr>
<tr>
<td></td>
<td>AVERAGE</td>
</tr>
</tbody>
</table>

**KNOWLEDGE Educational Objective**
- Industrial Technology graduates will demonstrate a balance of technical and managerial knowledge.

1. Knowledge of science, math and technical management. | 4.15 | 4.0 | 4.29 | 4.0 |
2. Knowledge of the role of technical management. | 4.15 | 4.0 | 4.29 | 4.0 |
3. Knowledge of systems and the integration of technologies. | 4.35 | 4.5 | 4.24 | 4.0 |
4. Knowledge of information technology including its use in a digital enterprise. | 4.10 | 4.0 | 4.24 | 4.0 |
5. Knowledge of contemporary technology/management issues. | 4.15 | 4.0 | 4.35 | 4.0 |

**SKILLS Educational Objective**
- Industrial Technology graduates will demonstrate the skills needed to apply business practices, information technology, and other technical skills necessary to collaborate with, organize, and lead interdisciplinary teams.

6. Ability to apply theories and principles to solve technical and management related problems. | 4.15 | 4.0 | 4.41 | 5.0 |
7. Ability to design, test and analyze a system or process to meet desired needs. | 4.35 | 4.5 | 4.65 | 5.0 |
8. Written, oral communication and presentation skills. | 4.35 | 5.0 | 4.59 | 5.0 |
9. Ability to exhibit supervisory and team leadership skills. | 4.45 | 5.0 | 4.53 | 5.0 |
10. Ability to collect, analyze and interpret data. | 4.45 | 5.0 | 4.71 | 5.0 |
11. Ability to collaborate within a digital enterprise with a multi-disciplinary project team. | 4.25 | 4.0 | 4.35 | 5.0 |
12. Ability to select and use computer applications software associated with desired needs. | 4.40 | 4.0 | 4.47 | 5.0 |

**ATTITUDES Educational Objective**
- Industrial Technology graduates will demonstrate a cooperative and inquisitive spirit that supports the desire to pursue lifelong learning, enables them to adapt to contemporary issues in the workplace, and helps advance the goals of their organization.

13. Understand ethical responsibility. | 4.40 | 5.0 | 4.65 | 5.0 |
14. Exhibit professionalism in my area of expertise. | 4.55 | 5.0 | 4.59 | 5.0 |
15. Recognize need for, and an ability to engage in life-long learning. | 4.70 | 5.0 | 4.65 | 5.0 |
16. Desire to stay current on issues. | 4.50 | 5.0 | 4.59 | 5.0 |
17. Desire to achieve a balance of workplace and personal goals. | 4.45 | 5.0 | 4.71 | 5.0 |
18. Desire to adopt emerging technologies to improve my area of expertise. | 4.70 | 5.0 | 4.53 | 5.0 |
19. Desire to support and promote the goals of my organization. | 4.55 | 5.0 | 4.65 | 5.0 |
7.13 Employment of Graduates

Placement, job titles, and salaries of graduates shall be tracked on a regular basis (two to five years). The jobs held by graduates shall be consistent with program/option goals. Summary data shall be available for the employment of graduates.

The jobs titles and salaries obtained from graduates of the Industrial Technology program are consistent with the program goals, which are verified by the alumni survey conducted fall 2012 to February 2013. The survey was sent to 108 alumni who graduated from the program between 2007 and 2011. All but four email addresses were valid. Forty-two graduates of the program responded to the survey for a return rate of 40%. The results of the survey are provided below as evidence that our program complies with this standard.

Industrial Technology Graduates

Figure 7.13.1 shows a range of responses from graduates. Eleven indicated they were employed before or during their enrollment in the program. Twenty-six graduates found employment from a range of less than three months to more than six months after graduating.

![Graph showing job search period for Industrial Technology Graduates]

Figure 7.13.1 – Job Search Period for Industrial Technology Graduates
Figure 7.13.2 shows that a majority of the forty-two respondents are employed full-time. None of the graduates employed full-time indicated they were seeking other employment. Four other respondents indicated they were seeking full-time employment.

A list of representative job titles obtained from the Alumni Survey of Industrial Technology graduates is provided below. Although this list is consistent with program goals, it is not inclusive of all graduates from 2007 to 2011. There are a number of students who have been affected by the downturn in jobs due to the economic recession during this period. Additional job titles can be provided outside the survey data and from graduates of the program prior to 2007, including members of our Industrial Advisory Board (IAB) who are alumni of our program.
Job Titles for Industrial Technology Graduates
Source: Alumni Survey

- Applications Engineer
- Art Department and Carpentry for Theatre
- Automation Projects Supervisor
- Automotive Technology Teacher
- Civil Designer / CAD
- Designer
- E-Government Manager
- Electronic Technician
- Engineering, service, warranty QC and color QC
- Equipment Technician
- Independent Contractor
- Industrial Property Management
- Inventory Control
- Manufacturing Engineer
- Manager
- Network Analyst
- Network Engineer
- Operations Engineer
- President / Owner
- Procurement-Materials Management
- Production Supervisor
- Project Analyst
- Project Engineer
- Project Management - Production Planning and Scheduler
- Project Manager
- Senior Automotive Property Damage Field Claims Representative
- Senior Piping Designer
- Senior Project Manager
- SITA Field Operations Technician
- Solar Installation Sales
- System Test Engineer
- Teacher
- Technician
Graduates of the program who are employed have classified their employers below in Figure 7.13.3. The classifications of employers shown below are consistent with program goals.

![Employer Classification for Industrial Technology Graduates](image)

**How would you classify your employer?**
*(Select all that apply)*

<table>
<thead>
<tr>
<th>Category</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARMED SERVICES</td>
<td>1</td>
</tr>
<tr>
<td>ENTERTAINMENT</td>
<td>1</td>
</tr>
<tr>
<td>INDUSTRIAL SAFETY</td>
<td>2</td>
</tr>
<tr>
<td>MEDICAL/PHARMACEUTICAL</td>
<td>2</td>
</tr>
<tr>
<td>UTILITY COMPANY</td>
<td>2</td>
</tr>
<tr>
<td>SELF-EMPLOYED</td>
<td>2</td>
</tr>
<tr>
<td>AEROSPACE</td>
<td>3</td>
</tr>
<tr>
<td>TECHNICAL MANAGEMENT</td>
<td>3</td>
</tr>
<tr>
<td>SYSTEMS INTEGRATOR</td>
<td>3</td>
</tr>
<tr>
<td>TEACHING/TRAINING</td>
<td>3</td>
</tr>
<tr>
<td>AUTOMOTIVE</td>
<td>4</td>
</tr>
<tr>
<td>QUALITY ASSURANCE</td>
<td>4</td>
</tr>
<tr>
<td>PROFESSIONAL FIRM</td>
<td>4</td>
</tr>
<tr>
<td>CONSULTING FIRM</td>
<td>4</td>
</tr>
<tr>
<td>SERVICE PROVIDER</td>
<td>4</td>
</tr>
<tr>
<td>EDUCATION</td>
<td>6</td>
</tr>
<tr>
<td>MAINTENANCE</td>
<td>6</td>
</tr>
<tr>
<td>INDEPENDENT CONTRACTOR</td>
<td>9</td>
</tr>
<tr>
<td>DESIGN</td>
<td>11</td>
</tr>
<tr>
<td>MANUFACTURING</td>
<td>11</td>
</tr>
</tbody>
</table>

*Figure 7.13.3 – Employer Classification for Industrial Technology Graduates*
Twenty-one of the forty-two survey (50%) respondents report a salary (Table 7.13.5) above $50,000 dollars. Eight out of the twenty-one respondents reported that they earn more than $80,000. Graduates making less than $30,000 report they are either employed part time and seeking a full-time position, or are attending graduate school.

![Figure 7.13.4 – Salary Range Data for Industrial Technology Graduates](image)

**7.14 Job Advancement of Graduates**

*The advancement of graduates within organizations shall be tracked on a regular basis (two to five years) to ensure promotion to positions of increasing responsibility. Summary data shall be available for the job advancement of graduates.*

The advancement of graduates has been tracked as part of our alumni survey and results of promotions, along with engagement in professional development activities. Summary data is provided below.

Thirty-nine of the forty-two graduates responded to the question related to receiving a promotion. Nineteen of thirty-nine (48%) reported receiving a promotion since obtaining their degree in Industrial Technology (Figure 7.14.1).
Fifteen of the nineteen (79%) survey respondents reported (Figure 7.14.2) a contributing factor to their promotion having completed their Industrial Technology degree.

![Figure 7.14.1 – Graduates reporting a promotion after graduating](image)

![Figure 7.14.2 – Perceptions of Factors attributed to Promotions](image)
Twenty-five of the thirty-nine (64%) survey respondents report having engaged in professional development activities (Figure 7.14.3) including conferences, seminars, workshops and professional society-related meetings.

Forty-one of forty-two alums responded to the question in Figure 7.14.4. Fifteen (37%) of the forty-one stated that part of their professional development included pursuit of professional certification and/or a graduate degree. Additional discussion of graduate success in advance programs is covered in section 7.16.
Employer satisfaction with the job performance of graduates shall be tracked on a regular basis (two to five years) including employer attitudes related to the importance of the specific competencies identified for the program. Summary data shall be available showing employer satisfaction with the job performance of graduates.

The Employer Survey was administered after the Alumni Survey during winter quarter 2013. Question no. two from the Alumni Survey asked alumni to “Tell us about your supervisor and employer” asking for their name, address, email, and phone number. Thirty-two out of forty-two responded to this question with varying responses. Twenty-seven provided a name of their supervisor, but some inserted their own name as supervisor because they owned their own business or they did not want to reveal their immediate supervisor.

Only eighteen respondents provided contact information (email and phone). Follow-up attempts were made with graduates to solicit their assistance in contacting their supervisors to participate in an Employer Survey. A discussion of the Employer Survey and results are provided. We asked for feedback on our 19 program outcomes and for supervisors to rate their satisfaction with our graduates based upon 13 workplace competencies that were addressed in Standard 7.2 – Competency Identification and Validation. Summary data is provided on the following pages.

Employer Rating of 19 Program Outcomes

Supervisors from four different employers of graduates participated in rating the 19 Program Outcomes. Supervisors were asked to rate the outcomes on a scale from 1 (extremely important) to 5 (not important). The results of the survey are shown below in Figure 7.15.1

Should we receive more survey results they will be made available to the evaluators during the site visit.
Figure 7.15.1 – Summary Data of Employer Ratings of 19 Program Outcomes
Employer Satisfaction with Job Performance of Graduates

After employers were identified, the individual supervisors were emailed directly with the following example:

Hi (insert name),

I am heading up an effort to accredit our B.S. Industrial Technology program.

Part of the process involves surveying employers of our graduates. Since (insert Company Name) has employed a number of our graduates over the years, would you be willing to take 5 to 8 minutes to complete our Employer Survey?

The survey does not identify the company, the person taking the survey nor employees.

1. We ask for a title, the company’s industry/business sector, number of employees hired (1,2,3,4 5 or more)
2. We ask employers to rate our 19 program outcomes
3. We ask employers to rate “satisfaction” of employees (B.S. Industrial Technology graduates in general) on 13 workplace competencies

Hope you can help us out with the employer survey.

Here is the link to our survey - https://www.surveymonkey.com/s/55RY3FQ

Sincerely,

Virgil Seaman, Advisor
Industrial Technology program
Cal State L.A.

The feedback from employers is limited in the number of responses due to a variety of factors such as: too busy, issues related to confidentiality and company secrecy (example R&D companies). Employers varied in the number of graduates they employed from our program. Summative data is provided below for the companies with the number of our alumni employees in brackets. Companies surveyed included:

1. A local nationally recognized government space agency/laboratory [3]
2. A large local engineering contracting firm (mechanical contracting, engineering and energy conservation) [1]
3. A large local company that designs and builds automation systems [5+]
4. A local testing laboratory which is part of the largest international food and bio/ pharmaceuticals products testing company in the world [1]
Supervisor No. 1: Satisfaction with Job Performance of 3 employees on 13 Workplace Competencies

<table>
<thead>
<tr>
<th>Competency</th>
<th>Very Satisfied (1)</th>
<th>Somewhat Satisfied (2)</th>
<th>Satisfied (3)</th>
<th>Not Satisfied (4)</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis &amp; Judgment - able to identify issues, problems &amp; opportunities</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication Abilities - able to clearly convey information and ideas</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Learner - able to use newly gained knowledge and skills on the job</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cultural Adaptability - able to interact effectively with individuals from a different cultural background</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Focused - develops and sustains productive customer relationships</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering and/or Technical Knowledge - knowledge level of math, science and technology</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiative - able to take action to achieve goals beyond what is required</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Innovation - able to try different or novel ways in dealing with work problems and opportunities</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>Integrity - able to maintain a code of conduct and professional ethical principles</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>Effective Planner - able to manage one's time and resources to complete work efficiently</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>Oriented Toward Quality - shows concern for all aspects of the job</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>Team Member - actively works as a team member to move the team toward completion of goals</td>
<td>X</td>
<td></td>
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<tr>
<td>Safety Awareness - able to identify and correct conditions affecting employee safety</td>
<td>X</td>
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</tbody>
</table>

Other - what other workplace competencies does your company value?:
Supervisor No. 2: Satisfaction with Job Performance of 1 employee on 13 Workplace Competencies

5. Using the 13 workplace competencies, rate your SATISFACTION related to the job performance of your employees who are graduates of the Industrial Technology program.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Very Satisfied (1)</th>
<th>Somewhat Satisfied (2)</th>
<th>Satisfied (3)</th>
<th>Not Satisfied (4)</th>
<th>N/A (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis &amp; Judgment - able to identify issues, problems &amp; opportunities.</td>
<td></td>
<td></td>
<td>X</td>
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</tr>
<tr>
<td>Communication Abilities - able to clearly convey information and ideas.</td>
<td></td>
<td>X</td>
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<tr>
<td>Continuous Learner - able to use newly gained knowledge and skills on the job.</td>
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<tr>
<td>Cultural Adaptability - able to interact effectively with individuals from a different cultural background.</td>
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<tr>
<td>Customer Focused - develops and sustains productive customer relationships</td>
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<tr>
<td>Engineering and/or Technical Knowledge - knowledge level of math, science and technology.</td>
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<tr>
<td>Initiative - able to take action to achieve goals beyond what is required.</td>
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<td>X</td>
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</tr>
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<td>Innovation - able to try different or novel ways in dealing with work problems and opportunities.</td>
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<tr>
<td>Integrity - able to maintain a code of conduct and professional ethical principles.</td>
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<tr>
<td>Effective Planner - able to manage one’s time and resources to complete work efficiently.</td>
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<tr>
<td>Oriented Toward Quality - shows concern for all aspects of the job.</td>
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<td>Team Member - actively works as a team member to move the team toward completion of goals.</td>
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<tr>
<td>Safety Awareness - able to identify and correct conditions affecting employee safety.</td>
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</table>

Other - what other workplace competencies does your company value?:

Supervisor No. 3: Satisfaction with Job Performance of 5 employees (or more) on 13 Workplace Competencies

<table>
<thead>
<tr>
<th>Competency</th>
<th>Very Satisfied (1)</th>
<th>Somewhat Satisfied (2)</th>
<th>Satisfied (3)</th>
<th>Not Satisfied (4)</th>
<th>N/A (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis &amp; Judgment - able to identify issues, problems &amp; opportunities.</td>
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<td>X</td>
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<tr>
<td>Communication Abilities - able to clearly convey information and ideas.</td>
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<tr>
<td>Continuous Learner - able to use newly gained knowledge and skills on the job</td>
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<td>X</td>
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<tr>
<td>Cultural Adaptability- able to interact effectively with individuals from a different cultural background.</td>
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<td>Customer Focused - develops and sustains productive customer relationships.</td>
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<tr>
<td>Engineering and/or Technical Knowledge - knowledge level of math, science and technology.</td>
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<tr>
<td>Initiative - able to take action to achieve goals beyond what is required.</td>
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<td>Effective Planner - able to manage one’s time and resources to complete work efficiently.</td>
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<tr>
<td>Oriented Toward Quality - shows concern for all aspects of the job.</td>
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<td>Safety Awareness - able to identify and correct conditions affecting employee safety.</td>
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<tr>
<td>Other - what other workplace competencies does your company value?: Work Ethic</td>
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</tbody>
</table>
Supervisor No. 4: Satisfaction with Job Performance of 1 employee on 13 Workplace Competencies

5. Using the 13 workplace competencies, rate your SATISFACTION related to the job performance of your employees who are graduates of the Industrial Technology program.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Satisfied (1)</th>
<th>Somewhat Satisfied (2)</th>
<th>Satisfied (3)</th>
<th>Not Satisfied (4)</th>
<th>N/A (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis &amp; Judgment - able to identify issues, problems &amp; opportunities.</td>
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<td>X</td>
</tr>
<tr>
<td>Communication Abilities - able to clearly convey information and ideas.</td>
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<td></td>
<td>X</td>
</tr>
<tr>
<td>Continuous Learner - able to use newly gained knowledge and skills on the job.</td>
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<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural Adaptability - able to interact effectively with individuals from a different cultural background.</td>
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<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Customer Focused - develops and sustains productive customer relationships.</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering and/or Technical Knowledge - knowledge level of math, science and technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Initiative - able to take action to achieve goals beyond what is required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Innovation - able to try different or novel ways in dealing with work problems and opportunities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Integrity - able to maintain a code of conduct and professional ethical principles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Effective Planner - able to manage one's time and resources to complete work efficiently.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Oriented Toward Quality - shows concern for all aspects of the job.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Team Member - actively works as a team member to move the team toward completion of goals.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Safety Awareness - able to identify and correct conditions affecting employee safety.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Other - what other workplace competencies does your company value?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.16 Graduate Success in Advance Program

If a goal of the program/option is to prepare students for advanced studies, then the success in the advanced study programs shall be tracked and confirmed. Summary data shall be available showing success in advanced programs.

Preparing students for advanced studies is not a goal of the Industrial Technology program; however, the third educational objective for the program revolves around attitudes that we hope our Industrial Technology graduates will hold once they gain employment. A component of this educational outcome involves the desire to pursue lifelong learning that enables them to adapt to contemporary issues in the workplace. Over the years the program has been in existence, a number of our graduates have pursued graduate programs at the master and doctoral levels.
As part of this accreditation effort, the alumni survey targeting graduates of the program between the years 2007 to 2011 included questions inquiring about graduate success in advanced study programs (Figure 7.16.1). Additional information outside the survey is provided on graduates (2011-2012) who have recently enrolled in a graduate program.

The only graduate program currently available in the Department of Technology is the Master of Arts in Industrial and Technical Studies. This degree is an education-based program. The Department is moving forward with a curricular proposal to move toward a Master of Science in Technology Leadership (MSTL) degree.

The new MSTL program will provide even better opportunities for graduate research and will be better aligned with the Industrial Technology bachelor degree with a focus on leadership and concentrations in these areas:

- Organizational Security
- Education and Training
- Product and Process Development

The alumni survey provides evidence that our B.S. Industrial Technology graduates are successful in advanced degree programs. Many are currently enrolled, and many have graduated with advanced degrees. Table 7.16.1 below lists the graduates who are currently pursuing an advanced degree, and Table 7.16.2 lists those who have completed an advanced degree. Please note that we have abbreviated their names to maintain confidentiality.
<table>
<thead>
<tr>
<th>NAME</th>
<th>GRAD DATE</th>
<th>EMPLOYER</th>
<th>CURRENT STUDY PROGRAM, UNIVERSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms. C. W.</td>
<td>2008</td>
<td></td>
<td>Certificate in Global Sustainability. Master of Science in Regenerative Studies, Cal Poly Pomona</td>
</tr>
<tr>
<td>Mr. J. F</td>
<td>2008</td>
<td>Teacher, Project Lead the Way, Los Angeles Unified School District</td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. C. O.</td>
<td>2007</td>
<td></td>
<td>M.A. in Industrial and Technical Studies, at Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. M. S</td>
<td>2007</td>
<td>Hydrogen Frontier Inc.</td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. H. B.</td>
<td>2009</td>
<td></td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. J. C.</td>
<td>2009</td>
<td></td>
<td>Master of Science in Environmental Technology Management</td>
</tr>
<tr>
<td>Mr. J. C.</td>
<td>2011</td>
<td></td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. W. H.</td>
<td>2011</td>
<td></td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. G. Q.</td>
<td>2011</td>
<td>Southern California Edison</td>
<td>M.A. in Industrial and Technical Studies, Cal State LA, Department of Technology</td>
</tr>
<tr>
<td>Mr. S. M.</td>
<td>2012</td>
<td>MOOG</td>
<td>Master of Science in Quality Assurance, Cal State Dominguez Hills</td>
</tr>
<tr>
<td>NAME</td>
<td>GRAD DATE</td>
<td>ADVANCED DEGREE</td>
<td>UNIVERSITY</td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>---------------------------------------------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Mr. M. C</td>
<td>1997</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>Vocational education: history and legislation</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td>Ph.D. in Education and Human Resources</td>
<td>Colorado State University</td>
</tr>
<tr>
<td>Mr. A. P.</td>
<td>1999</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>Product data management at an aerospace company in Southern California: a case study</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. C. C.</td>
<td>1999</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>A review of rapid prototyping and its impact on technology and manufacturing</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Z. A.</td>
<td>2000</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: The development of a technology education-learning module concerning an introduction to circular motion</td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2009</td>
<td>Ph.D. in Engineering and Technology Education</td>
<td>Utah State University</td>
</tr>
<tr>
<td>Mr. O. V.</td>
<td>2002</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>Frito-Lay sales operations computer-based training manual proposal for Southern California distribution centers management team</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. D. P.</td>
<td>2003</td>
<td>MBA, while working for Northrop Grumman / Then transferred to Tooling Inspection and Data at Northrop as a Quality Engineer.</td>
<td>The Paul Merage School of Business at UC Irvine</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. B. O.</td>
<td>2005</td>
<td>M.S. in Manufacturing Systems Engineering while working for Walt Disney Imagineering</td>
<td>Cal State Northridge</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. N. V.</td>
<td>2006</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>Anti-lock brake system (ABS) warning light</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2008</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. J. D.</td>
<td>2008</td>
<td>Master in Organizational Leadership / E-Government Manager for the City of Beverly Hills, CA</td>
<td>unknown</td>
</tr>
<tr>
<td>Mr. J. V.</td>
<td>2004</td>
<td>M.A. in Industrial and Technical Studies / Thesis topic: <em>Development of two green engineering technology courses for community colleges</em></td>
<td>Cal State LA, Department of Technology</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. Doug A.</td>
<td>2007</td>
<td>Masters Organizational Leadership</td>
<td>Gonzaga University</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mr. J. V.</td>
<td>2001</td>
<td>MBA</td>
<td>Pepperdine University</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.17 Student Success in Passing Certification Exams

If a goal of the program/option is to prepare students to pass certification examinations, then the success in passing these examinations shall be tracked and confirmed. Summary data shall be available showing success in passing certification exams.

Cisco Certified Network Associate Certification Exam (CCNA)

Industrial Technology majors who have selected the concentration in “Internetworking” have been encouraged by Dr. Le Tang to sign up to take CISCO CCNA certification exams after completing these courses within the concentration:

- TECH 421 Internetworking Technology – Required Core
- TECH 422 Router Configurations (4) – Concentration
- TECH 423 Intermediate Routing and LAN Switching (4) – Concentration
- TECH 424 Wide Area Networks (4) - Concentration

Related CISCO Certification Exam websites:

https://learningnetwork.cisco.com/community/certifications

Student Results for the CCNA Certificate Exam

The Department of Technology does not require students to pass certification exams as a requirement for the B.S. Industrial Technology program. However, we do know that at least 17 students took and passed the CCNA certification exam since fall quarter, 2008 based on personal contacts.

Although there are only a small number of technology students whose concentration is in Internetworking, students from other majors also take Cisco courses for their career considerations. Of the 17 students passing the certification exam, five were Industrial Technology majors. However, we don’t know if there were students who took the exam but didn’t pass, so it is not possible to know exactly how many students took the exams or the actual the passing rate.

Table 7.17.1 below lists the distribution of students by major:
Table 7.17.1 Distribution of Students Taking/Passing CCNA Exam

<table>
<thead>
<tr>
<th>MAJOR</th>
<th>STUDENTS TAKING &amp; PASSING</th>
<th>PERCENTAGE BY MAJOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>5</td>
<td>29%</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>8</td>
<td>47%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>2</td>
<td>12%</td>
</tr>
<tr>
<td>Computer Information System</td>
<td>2</td>
<td>12%</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>100%</td>
</tr>
</tbody>
</table>

All of the electrical engineering students who passed the CCNA exam were international students from India, where CCNA certification has a very favorable reputation. The Department of Computer Information Systems is currently establishing a more formal pathway for their majors to select CCNA as their technical option.

**Society of Manufacturing Engineers**

Dr. Jai Hong incorporates the SME Manufacturing Challenge team-based activities into his class, TECH 460 Manufacturing, Materials and Processes to prepare his student teams to enter their manufactured products in the WESTEC SME Manufacturing Challenge. Students have been successfully competing since 2005 and will be there again in 2013. In 2012, three teams entered products and two placed (details below).

At the 2012 WESTEC SME Manufacturing Challenge, the Cal State L.A. Peppermill team, comprised of CSULA students Greg Burkhardt, Cesar Campos, Juan Meza, Rafael Minas and Greg Villareal, won second prize for creating a new technique to control the grinding process.

The grinder incorporated food grade 17-4 precipitation-hardening stainless steel and acrylic materials, and a classy design, to meet Food and Drug Administration standards.

“Our goal was to improve the quality of controlling cracked pepper form and salt crystal size," explained Campos, industrial technology major and leader of the Cal State L.A. Pepper Mill team. “We were challenged to manufacture a real product from initial concept to the actual prototype.”

The project, designed using 3D modeling, demonstrated various machining techniques, including computer numerical control machining, Wire EDM machining, and manual and automated late machining.

In addition to this honor, Campos indicated that they received compliments that the Cal State L.A. Pepper Mill will make an excellent restaurant or household product. He said, “One of the judges wanted to buy the grinder off us on the spot.” — CSLA Website
The Eagle Stove team members (Karo Genanyan, David King, Steven Macias and Antonio Romero) won third prize for their eco-friendly and lightweight camping stove constructed from a combination of stainless steel and brass.

The design concept was modeled after the Mountain Safety Research Whisperlite hybrid-fuel backpacking stove.

“This project showcased the expertise of each team member in design, manufacturing, time management, communication and team work,” said Macias, industrial technology major and leader of The Eagle Stove team.

“It was a great experience to be part of developing an idea on paper to a fully-functional product. Also, it was pretty cool to be approached by individuals at the competition about actually purchasing our Eagle Stove for their camping trips.”

— CSULA Website

Although the faculty have had prior discussions about the benefits of our students taking the Certified Manufacturing Technologist (CMfgT) exam as an assessment tool, the fee of $95 for SME student members and $195 for student non-members would be an overwhelming burden for them.
ATMAE Certification Exam

Drs. Jai Hong and Virgil Seaman attended several presentations related to ATMAE certification exams during the annual 2011 ATMAE conference. Of the four exams provided by ATMAE, it was decided as part of our assessment plan to examine these two options:

1. Certified Manufacturing Specialist (CMS) Exam

   This exam can be used for individual certification and for program assessment. It is an open-book, 180-question, multiple-choice examination; however, for program assessment, the school may choose a closed-book format. Passage of the exam is determined by a cumulative score on the examination.

   The exam content areas are listed on the next page.

2. Certified Technology Manager (CTM) Exam

   This exam can be used for individual certification and for program assessment. It is an open-book, 160-question, multiple-choice examination; however, for program assessment, the school may choose a closed-book format. Passage of the exam is determined by a cumulative score on the examination.

   Exam questions are about Production Planning and Control, Safety, Quality, Management, Supervision, and other rudimentary questions pertaining to Algebra, Trigonometry, Physics, Chemistry, and English.

The cost for taking an ATMAE Certification exam is:

- Individual examination fee: $20
- Group of individual exams for program assessment
  - 1 to 12 exams: $20 per exam
  - 13 or more exams: $250 flat rate

Exam fee policies:

- For individual online examinations, the exam fee must be paid or secured prior to the exam session.
- For group exam sessions, the exam fee may be paid in advance or by invoice after the exam session.
- Exam results are not released until the exam fees for an exam session have been paid.
### Certified Manufacturing Specialist Exam Content

1. **Manufacturing Joining Processes**
   - 1.1 Brazing and Soldering
   - 1.2 Solid State/Resistance Welding
   - 1.3 Arc/Gas Welding
   - 1.4 Arc/Gas Cutting
   - 1.5 Mechanical Fastening

2. **Manufacturing Forming Processes**
   - 2.1 Shearing
   - 2.2 Drawing, Extrusion, and Forging
   - 2.3 Bending
   - 2.4 Sheet Metal Classification
   - 2.5 Sheet Metal Fabrication Nomenclature

3. **Manufacturing Casting Processes**
   - 3.1 Casting Nomenclature
   - 3.2 Expendable-Mold Casting
   - 3.3 Permanent-Use Casting

4. **Nontraditional Machining**
   - 4.1 Chemical
   - 4.2 Electrical
   - 4.3 Mechanical
   - 4.4 Thermal

5. **Machining**
   - 5.1 Abrasive
   - 5.2 Turning
   - 5.3 Milling
   - 5.4 Hole Making
   - 5.5 Thread Manufacturing
   - 5.6 Gear Manufacturing
   - 5.7 Miscellaneous Machining Processes
   - 5.8 Feed, Speed, and Material Removal Rate Calculations

6. **Manufacturing Philosophies**
   - 6.1 Lean
   - 6.2 Theory of Constraints
   - 6.3 Benchmarking
   - 6.4 TQM

7. **Polymers**
   - 7.1 Molecular Composition and Properties
   - 7.2 Types of Plastics
   - 7.3 Processing Equipment
   - 7.4 Chemicals and Additives
   - 7.5 Mold Pressure Calculations

8. **Industrial Materials**
   - 8.1 Heat Treatment of Materials
   - 8.2 Phases of Ferrous Materials
   - 8.3 Material Classifications and Properties
   - 8.4 Material Tests
   - 8.5 Material Strength Terminology

9. **Computer Integrated Manufacturing**
   - 9.1 G&M Code Terminology
   - 9.2 CNC and CAD/CAM Nomenclature
   - 9.3 Types of Manufacturing Systems
   - 9.4 Robotics

10. **Quality**
    - 10.1 Control Charts
    - 10.2 Six Sigma Quality & ISO Standards
    - 10.3 Statistical Concepts
    - 10.4 Quality Management
    - 10.5 Diagrams

11. **Production Planning**
    - 11.1 Techniques for Process Planning
    - 11.2 Capacity Planning
    - 11.3 Master Production Scheduling
    - 11.4 Inventory Planning and Control

12. **Wood Technology**
    - 12.1 Types of Lumber
    - 12.2 Classification of Lumber
    - 12.3 Types of Wood Processing Equipment
    - 12.4 Adhesives
    - 12.5 Wood Joints
    - 12.6 Abrasives

13. **Metrology**
    - 13.1 Standards of Measurement
    - 13.2 Decimal Equivalency
    - 13.3 Measuring Instruments and Machines
    - 13.4 Reading Measuring Instruments

14. **Supervision/Management**
    - 14.1 Management Concepts and Skills
    - 14.2 Roles of Managers and Supervisors
    - 14.3 Functions of Management
    - 14.4 Communication and Motivation
    - 14.5 Relationship and Team Building
    - 14.6 Leadership Styles
    - 14.7 Appraisal and Discipline
    - 14.8 Discrimination

15. **Technical Drafting**
    - 15.1 Multi-view Projection
    - 15.2 Axonometric Projection
    - 15.3 Oblique Projection
    - 15.4 Perspective Projection
    - 15.5 Geometric Dimensioning and Tolerancing
    - 15.6 Drafting Nomenclature
    - 15.7 Classification of Fits
    - 15.8 Sectional Views

16. **Electronics**
    - 16.1 Electronic Components
    - 16.2 Electrical Power
    - 16.3 Electric Motors
    - 16.4 Circuits, Voltage, Resistance, and Current
Pilot ATMAE Certified Manufacturing Specialist (CMS) Exam and TECH 460

Dr. Jai Hong prepared his twenty-one students enrolled in TECH 460 Manufacturing, Materials and Processes during winter quarter, 2013, to take the ATMAE CMS exam to establish a baseline of student knowledge. The CMS exam was administered on Thursday, March 7, 2013.

The CMS exam was chosen over SME’s Certified Manufacturing Technologist due to the cost of administering the exam. All twenty-one students can take the ATMAE exam for $250, whereas the SME would cost $95 per student if they are SME members — and $195 if they are not!

March 7, 2013 CMS Exam — Results Overview

Seventeen students from TECH 460 took the ATMAE CMS exam. Although only two students passed the exam, the results are very positive.

Strengths. The students’ scores in these categories are average or above:

1. Computer Integrated Manufacturing
2. Electronics
3. Machining
4. Manufacturing Casting Process
5. Manufacturing Joining Process
6. Nontraditional Machining
7. Polymers
8. Production Planning
9. Quality
10. Supervision Management
11. Technical drafting
12. Wood technology

Weaknesses. The students’ scores in these subcategories are 15% below the yearly averages and historic averages of all the schools participating in the certification:

1. Sheet Metal
2. Lean Manufacturing
3. Theory of Processes
4. Processing Equipment
5. Material Testing
6. Reading Diagrams
7. Techniques for process planning
8. Capacity Planning
9. Measuring Instruments and Machines

The exam was comprised of 160 questions, and 100 questions had to be answered correctly to pass the exam. Although the class fell short on all areas of the exam by about 10%, four students almost passed with scores of 99, 99, 96, and 95. Had they passed, we would have had a 35% passing rate.
Relative to TECH 460 Manufacturing Materials and Processes, the data shows that the students have a general understanding of materials used in manufacturing and the technical processes and machines used to manufacture. However, when asked the specifics of manufacturing processes the students fall short of the nomenclature and/or knowledge of detailed specifics. This is probably due to the fact the students did not prepare well for the exam. Another reason is the vision and mission of the Technology program is to generate entry level managers, not skilled labor.

The CMS exam results are available in the CMS Exam Results TECH 460 folder in the Appendices on the SharePoint Server.

Summary

We need time to analyze the results as part of our assessment processes before implementing any curriculum changes.

### 7.18 Advisory Committee Approval of Overall Program

An industrial advisory committee shall exist for each program/option and shall participate in general outcome and competency validation and the evaluation of overall program success. If more than one program of study or program option is available, then appropriately qualified industrial representatives shall be added to the committee or more than one committee shall be maintained. Policies for the advisory committee shall exist that include: (a) criteria for member selection; (b) procedures for selecting members; (c) length of member appointment; (d) committee responsibilities; (e) frequency of meetings (at least one per year); and (f) methods of conducting business. A roster of advisory committee members and minutes of advisory committee meetings shall be made available to the visiting team.

We have a very active and supportive Industrial Advisory Board (IAB) and the By-Laws and policies for the advisory committee as described below meet the ATMAE requirements. We believe we comply with this standard.

The Department of Technology has an external Industrial Advisory Board (IAB) that helps guide the Industrial Technology program. Members of committee consist of alumni from the program and industrial members external to the program.

**Criteria for Member Selection**

- Professionals holding technical and/or technical management positions from various industries capable of facilitating program quality.
- Professionals representative of the breadth of industries, i.e., design, manufacturing, energy, internetworking, graphic, for which the program prepares.
- Professionals representative of the demographics, i.e., gender, ethnicity, age, etc., of the students in the program.
- At least 50% of the board members are program alumni.
- No more than two members representing education.
Procedures for Selecting Members

- Each IAB member shall be appointed by the Chair of Department of Technology with consultation of ITEC program faculty.

Length of Member Appointment

- Each appointment to the IAB shall be for three years, except when the appointment is to fill an unexpired term.
- Each IAB member can be reappointed up to three consecutive terms.
- Any member may resign his or her membership in IAB by submitting a signed resignation to the Chair of IAB.
- Any member missing two consecutive meetings without due cause shall be considered disinterested and dismissed from membership.

Committee Responsibilities

The purpose of the IAB is to advise, support, and promote the ITEC program at Cal State LA. A primary function is to facilitate the continuous improvement of program quality and scope by keeping the program current and relevant. Specific objectives of the IAB include:

- Review and provide input to the mission and goals of the Industrial Technology program.
- Review and provide input to the objectives and learning outcomes within the Industrial Technology program.
- Provide the Industrial Technology program with suggestions for programs content and direction.
- Support the Industrial Technology program for the following activities:
  - program development
  - program publicity
  - student interns and co-op placement
  - alumni employment
  - faculty development
  - joint project collaboration
  - guest speakers
  - donations and other financial assistance

Frequency of Meetings (at least one per year)

- The IAB shall meet at least twice each academic year. Additional meetings may be scheduled as needed.
- A quorum shall consist of one more than half of the active members of IAB.
Methods of Conducting Business

• The IAB shall elect three officers: President, President-Elect, and Recording Clerk. Officers shall serve a one-year term.

• The regular term of office shall be from July 1 to June 30 the next year. The election shall be held once a year during the spring meeting. Nominations shall be taken from the floor.

• The President shall preside at each meeting, coordinate all IAB activities, schedule meetings, and prepare agendas.

• The President-Elect shall assist the President as necessary and prepare to serve as the next President.

• The Recording Clerk shall record the meeting minutes, maintain and distribute documentation, and send meeting notices.

• The Chair of Department of Technology and his or her staff shall assist the President in all IAB activities.

• Robert’s Rules of Order shall govern.

• IAB meetings have been held on campus.

• Meetings and facility tours held off site at Southern California Edison Technical Center

• Annual June meetings held during Senior Design Presentation Days with IAB members as industry judges.

• Several meetings were conducted through the use of GoTo.com to save travel and time for the IAB members.
Evidence shall be presented showing how multiple outcome measures for example (Graduate Satisfaction with Program/Option, Employment of Graduates, Job Advancement of Graduates, Employer Satisfaction with Job Performance, Graduate Success in Advanced Programs, Student Success in Passing Certification Exams, and Advisory Committee Approval of Program) have been used to improve the overall program option (please use the attached table 7.19). Evidence that program stakeholders participate in this process must be demonstrated.

As part of our assessment plan, assessment data is collected and analyzed by the assessment coordinator (Dr. Seaman). Assessment findings are presented to faculty during department meetings followed by discussion and feedback. We are adapting to outcomes-based program assessment, and submit the following evidence in Table 7.19 below as measures used to improve the program. The two reasons related to program improvements are provided in the table in the areas labeled “Why it was Done.”

Additional information on how we provide program-related marketing materials and student performance and achievement information via the web is ALSO provided below the table.
### TABLE 7.19 - Outcomes Measures Used to Improve Program

<table>
<thead>
<tr>
<th>Program Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Program Name:</strong> B.S. Industrial Technology</td>
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#### 1. What was Done

Improved the capstone experience (TECH 495 Practicum in Industrial Technology) through the implementation of a data collection instrument for assessment of five learning outcomes. A presentation evaluation form was used by eight Industrial Advisory Board members and one other industry representative to rate four Senior Design Day team presentations. Teams were rated on how they achieved five learning outcomes related to their final project for the quarter.

Feedback on presentation delivery from 2012 will be used to improve teams’ preparation for Senior Design Day 2013.

#### Why it was Done

The previous year, the IAB members did not have a rating instrument to evaluate student teams so that we would have data to assess the course SLOs to feedback into the process for improvement. We are working to improve our efforts to better integrate our capstone experience within the College of ECST’s Senior Design initiatives.

#### Supporting Evidence

- Section 7.4 – Assessment of Competency Measures and IAB members participating in Senior Design Day – Sideheading Senior Capstone Experience: Industry Practicum – TECH 495
- Appendices – Team Rating Sheets from IAB members are in the Senior Design Day 2012 folder under Appendices on the SharePoint server

#### 2. What was Done

Reexamination of all Program Outcomes to make them more measurable and build in workplace competencies.

- Surveyed Seniors (Exit Survey on satisfaction with program outcomes)
- Alumni Survey rating Importance/Satisfaction of Program Outcomes
- Survey of Faculty and IAB members on Workplace Competencies.
- A sub-committee met in winter quarter 2013 to draft a proposed set of new program outcomes to be vetted.

#### Why it was Done

- Feedback from IAB on concerns that some program outcomes could not be measured.
- Faculty and IAB identified duplication in program outcomes.
- Employers use competencies when advertising jobs. We need to prepare our students to possess workplace competencies to make them more marketable when seeking employment.

#### Supporting Evidence

Under Appendices on SharePoint server located in these folders:

- Industrial Advisory Board documents
- Department Meeting Minutes
- Survey Instruments
- Program Outcomes - Revised Proposed
**Please provide evidence of how each Program:**

1. **makes available via website, student marketing material or other means;**

   The Department of Technology has an excellent working relationship with the [University Office of Public Affairs](#). We work closely with Paul Browning (Director), Bernard Kane (Photographer) and Margie Low (Communications Specialist) who supports us by covering events and providing press releases of activities and student competitions.

   The Department of Technology websites and program pages have been maintained by Dr. Virgil Seaman using campus approved web templates.

   Student marketing materials are available through a number of websites via the College of Engineering, Computer Science, and Technology and the Department of Technology website for the B.S. Industrial Technology program.

   A list of files for these student marketing materials is shown below and is available for review on the SharePoint server in the Appendices under a folder entitled “Program Publicity documents”. 
ASM10-24-Hydrogen-Station
B.S. Industrial Technology program _ Cal State LA
Cal State L.A. _ Spotlight
Cal State L.A. TODAY _ The next solar generation
Cal State L.A. TODAY _ University News
ccn-blekhman-fulbright
CSULA CETL _ 2013-14 Lipton_Modarres Fellowship
CSULA Hydrogen Research Facility
ECSTlayoutFINALR4indd
ECSTnewsletter03cISSUE
Fast Facts about CSULA’s College of ECST
Fieldtrip _ Dassault Systemes
LEGO Mindstorms Project _ Spotlight
NCETE _ Partners _ University of Illinois at Urbana-Champaign
News and Information-Hydrogen-Station
News Release_ DoD Nunn-Perry Award Cal State LA
News Release_ HP Collaborative Learning Center Cal State LA
News Release_ Hydrogen Research Fueling Facility Cal State LA
News Release_ Solar Panel Project Cal State LA
News Release_ sustainability Cal State LA-Blekhman
Newsroom - California State University Los Angeles
NGC-Paul_Liu
Page 21 - StrategicPlan0002-Lipton
Power, Energy and Transportation Laboratory – CSULAs College of ECST
State_of_the_University_Address_2012-Blekhman
University Reports Home Page-Blekhman
University Reports Home Page-Prophets of Science
2. **Student performance and achievements to the public as may be determined appropriate by the institution or the Program**

Examples of student performance and achievements such as student competitions are available to the public via University websites. A list of files for these student achievements is shown below and is available for review on the SharePoint server in the Appendices under a folder entitled “Student Competitions”.

- AeroDef Competition _ Spotlight
- Cal State L.A. TODAY _ University News-WESTEC-2010
- Cal_State_LA_Article
- Hydrogen Student Design Contest _ Spotlight
- News Release_ CSULA Super Eagle
- News Release_ CSULA WESTEC Challenge First Place Boundary-Layer Turbines
- News Release_Golden Eagle Pinball Machine Cal State LA
- SGVN-SuperEagle
- WESTEC Challenge 2010 _ Spotlight
- WESTEC Manufacturing Challenge 2012 _ Spotlight
Appendix
Faculty Curriculum Vitae