



# Developing Career Concentrations

## A Design Approach for Austin High Schools

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Austin Independent School District  
Austin, Texas

Prepared by:

SREB, *High Schools That Work*  
Contact Person: Gene Bottoms, Senior Vice President

## SREB

Southern  
Regional  
Education  
Board

592 10th St. NW  
Atlanta, GA 30318  
(404) 875-9211  
[www.sreb.org](http://www.sreb.org)

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# Developing Career Concentrations A Design Approach for Austin High Schools Austin Independent School District (AISD)

## Purpose of the Report

Today's high schools are failing to equip their students with the skills needed to successfully enter college and a career. Graduation rates are dropping. Students are isolated from the world of work. They are disengaged from learning and do not connect their high school course of study to life outside the school. These findings are no different for AISD high schools.

A clear sense of purpose brings about student engagement, motivation and hope and yields higher achievement. Based on the findings from 1,000 schools implementing the *High Schools That Work (HSTW)* improvement model, students in schools that teach challenging academic studies and quality career/technical studies have higher achievement.<sup>1</sup> Career oriented students in these schools take more academic courses taught at a high level than do students at many other schools. They also take more high-quality career/technical courses designed to prepare students for broad career fields and postsecondary studies. These students have the opportunity to see the connection between what they learn in high school to what they will do in college and career. They are on the path to success.

The summary of the Carl D. Perkins Secondary and Technical Education Excellence Act<sup>2</sup> reinforces the importance of students being fully prepared for college and career:

*Technology, changing demographics, and global economic competition are combining in unprecedented ways to change work and redefine the American workplace. Unlike jobs a half-century ago, most of today's job positions that pay family-supporting wages and offer opportunities for advancement demand strong academic and technical skills, technological proficiency, and some education and training beyond high school. Our prosperity and competitive edge hinge on the ability of our nation's schools to prepare every American for the future.*

*Given these dynamics, it is clear that – for the first time – every U.S. student needs to complete high school with a high level of academic skills and be prepared to take advantage of education and training beyond high school.*

**So how does all of this apply to Austin high schools?** Most of the career and technical education (CATE) programs at high schools in the Austin Independent School District (AISD) are out of step with the workforce demands of the 21<sup>st</sup> century. For the most part, they do not focus on preparing

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<sup>1</sup> *Using Rigor, Relevance and Relationships to Improve Student Achievement: How Some Schools Do It. (2004 Outstanding Practices).* Southern Regional Education Board, *High Schools That Work.* 2004.

<sup>2</sup> *The Carl D. Perkins Secondary and Technical Education Excellence Act Summary of Major Provisions.* U.S. Department of Education, Office of Vocational and Adult Education. May 11, 2004.

students for high-demand, high-skill jobs and they are not aligned to industry and postsecondary standards. Austin students have few options for completing a coherent sequence of at least four career/technical courses in a broad career field that fully prepares them for college and career.

The district recognizes that its programs are below par and contracted with Austin Community College (ACC) this past year to manage these programs. It also entered into an agreement with the Southern Regional Education Board (SREB) through *High Schools That Work (HSTW)* to conduct an audit review and benchmarking study of its 11 comprehensive high schools to address the extent to which the schools are currently meeting the goals specified by the Board of Trustees in Results Policy #3.

One of these goals is that students will “graduate as a Texas Scholar with a jumpstart on college and career success, including consideration of postsecondary credit, industry certification, and scholarship opportunities.” The district is to:

- § Increase the number and percent of students completing coherent pathways in a career concentration annually.
- § Increase the number and percent of students completing industry certifications annually.
- § Increase the numbers and types of institutes/academies (tracked by career demand areas).
- § Increase the number of coherent pathways offered at AISD high schools.
- § Increase the number and type of completed college articulation agreements (tracked by career demand areas).
- § Increase the number and type of industry certifications in College and Career Preparatory Program (CCPP) programs.

The challenge facing the district is to redesign and expand its CATE programs so that every student benefits from them no matter what his or her ultimate career goal may be. The district wants its graduates to leave high school with a sound academic background, a postsecondary and/or career goal and prepared with marketable workplace skills.

The primary objective of this design report is to provide a framework for the district to use to develop its career/technical programs into coherent sequences of at least three –preferably four – related and progressively more in-depth courses aligned with postsecondary studies and workforce demands that lead to AISD graduates’ successful transitions to college and career.

## **Basis for the Framework**

The proposed framework for developing career and technical concentrations for Austin high schools is constructed from district input, from state goals and objectives for secondary career and technology education (*See Appendix 1.*), and the following assumptions:

- § The U.S. Department of Education (USDOE) 16 career clusters are the starting point for the design but are combined into 11 clusters for Austin’s consideration.

- § All CATE programs will be re-configured into areas of concentration and re-aligned into career pathways with a coherent sequence of academic studies within these clusters, and some clusters may form an institute.
- § Areas of concentration for the career pathway will focus on high-skill, high-wage jobs with promising demand in the Austin area and the state of Texas.
- § The ratio for the number of graduates from AISD to the number from the state of Texas will serve as the estimate for the percentage of new and replacement jobs across the state that AISD students should expect to fill.
- § Areas of concentration will focus on programs of study that lead to postsecondary degrees, certification or licensure.
- § Certain programs will be included because of their generic value in building skills and knowledge for all occupations and learning.
- § The distribution of graduates across academic and career/technical programs will follow a 20-30-60 pattern taking into account that some students would complete more than one area of concentration. Using this distribution, at least 20 percent of the students will complete a mathematics and science concentration, at least 30 percent would finish a humanities concentration and 60 percent would fulfill the requirements for a career/technical concentration in a broad career field.
- § All students will graduate from AISD high schools with at least six semester college credits in academic and career technical courses on their transcripts.
- § College semester courses typically have 48 contact hours compared to 75 hours in high school semester courses. Therefore, students will have to spend more time outside of class – at least three hours a week – preparing for these dual credits courses so that they can meet standards for college credit.
- § Teachers within areas of concentration will be certified in the content area and would meet both high school and college requirements allowing the course to carry dual credit.

The following discussion provides more information about these assumptions, career clusters and areas of concentration in order to help district leaders prioritize the implementation of career pathways in Austin high schools, decide which areas of concentration will be offered at which high schools, and determine what and how many institutes the district intends to support.

**The primary intent is for this framework to be a dynamic design that district and school leaders will adjust and update as student populations and market demands change.**

## Career Clusters

Although the US Department of Education categorizes jobs into 16 career clusters, this design combines five USDOE clusters into closely related ones for a total of 11 clusters for AISD:

- § Agriculture and Natural Resources
- § Arts, A/V Technology and Communications
- § Business, Finance and Marketing
- § Education and Training
- § Medical Science and Health Services
- § Hospitality and Tourism
- § Human Services
- § Information Technology
- § Manufacturing and Construction
- § Legal and Protective Services
- § Engineering, Technical Services and Transportation

The design for each cluster includes at least three areas of concentration with coherent sequences of courses that would provide AISD students a jumpstart on college and careers. (*See Table 1.*) In addition, a concentration in mathematics and science and one in humanities will be concentrations within the cluster if relevant. Rigorous, college-preparatory courses are the foundation for these broad-based concentrations. According to rules set by the Texas Higher Education Coordinating Board<sup>3</sup>, high school students may take a maximum of two (2) college credit courses per semester, which could yield as many as 12 college credits during the senior year. (*See Appendix 2.*)

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<sup>3</sup> Chapter 4. Rules Applying to All Public Institutions of Higher Education in Texas, Subchapter D. Dual Credit Partnerships Between Secondary Schools and Texas Public Colleges. The Texas Higher Education Coordinating Board, May 2004. ([www.theccb.state.tx.us/DBRules/PDF/Ch4SubD.pdf](http://www.theccb.state.tx.us/DBRules/PDF/Ch4SubD.pdf))

**Table 1  
Proposed Career Clusters and Concentrations for Austin High Schools**

<b>USDOE Clusters</b>	<b>Proposed Career Cluster</b>	<b>Concentrations</b>	<b>ACC Degree Programs*</b>
Agriculture & Natural Resources	Agriculture & Natural Resources	<ul style="list-style-type: none"> <li>§ Environmental Sciences</li> <li>§ Pre-veterinary</li> <li>§ Landscaping &amp; Design</li> <li>§ Mathematics &amp; Science</li> </ul>	Environmental Science & Technology; General Studies in Science; Pre-Veterinary
Arts, Audio, Video Technology & Communications Services	Arts, A/V Technology & Communications	<ul style="list-style-type: none"> <li>§ Communications;</li> <li>§ Visual &amp; Graphic Arts</li> <li>§ Performing Arts (could include specializations in dance, music or theatre)</li> <li>§ A/V Technology</li> <li>§ Humanities</li> </ul>	Art; Digital Publishing; Drama; Journalism; Music; Radio-Television-Film; Technical Communications; Visual Communication Design
Business & Administrative Services <b>COMBINED WITH:</b> Financial Services Wholesale/Retail Sales & Services	Business, Finance & Marketing	<ul style="list-style-type: none"> <li>§ Management</li> <li>§ International Business &amp; Marketing</li> <li>§ Marketing, Sales &amp; Merchandising</li> <li>§ Financial Management &amp; Banking</li> <li>§ Accounting</li> <li>§ Office Administration</li> <li>§ Humanities</li> <li>§ Mathematics &amp; Science</li> </ul>	Business Administration; Management; Office Administration; Accounting; Economics; Financial Management; Fashion Merchandising; Marketing
Education & Training Services	Education & Training	<ul style="list-style-type: none"> <li>§ Teacher Cadet</li> <li>§ Early Childhood Development</li> <li>§ Humanities</li> <li>§ Mathematics &amp; Science</li> </ul>	Child Development; General Studies Early Childhood Education
Health Services	Medical Science & Health Services	<ul style="list-style-type: none"> <li>§ General Medicine</li> <li>§ Pre-Nursing</li> <li>§ Medical Services &amp; Technology</li> <li>§ Emergency Services</li> <li>§ Sports Medicine</li> <li>§ Mathematics &amp; Science</li> </ul>	Biotechnology; Dental Hygiene; Emergency Medical Services; Medical Laboratory Technology; Nursing; Occupational Therapy; Pre-Dental; Pre-Medical; Pre-Pharmacy
Hospitality & Tourism	Hospitality & Tourism	<ul style="list-style-type: none"> <li>§ Travel &amp; Tourism</li> <li>§ Hospitality Management</li> <li>§ Culinary Arts</li> <li>§ Humanities</li> </ul>	Hospitality Management; Culinary Arts; Meeting & Events Planning; Travel & Tourism
Human Services	Human Services	<ul style="list-style-type: none"> <li>§ Family &amp; Community Services</li> <li>§ Cosmetology</li> <li>§ Protective Services</li> <li>§ Humanities</li> </ul>	Addiction Counseling; General Human Services; Social Work; Fire Protection
Information Technology Services	Information Technology	<ul style="list-style-type: none"> <li>§ Network Systems</li> <li>§ Information Support &amp; Services</li> <li>§ Computer Programming &amp; Software Development</li> <li>§ Computer Repair</li> </ul>	Computer Information Technology; Computer Science; Electronics
Manufacturing <b>COMBINED WITH:</b> Construction	Manufacturing & Construction	<ul style="list-style-type: none"> <li>§ Architectural Drafting &amp; Design</li> <li>§ Building Construction &amp; Technology</li> <li>§ Heating, Air Conditioning &amp; Refrigeration Technology</li> <li>§ Welding</li> <li>§ Quality Assurance</li> <li>§ Electronics</li> <li>§ Mathematics &amp; Science</li> </ul>	Building Construction Technology; Heating, Air Conditioning & Refrigeration Technology; Welding Technology; Quality Assurance; Electronics;
Public Administration & Government Services <b>COMBINED WITH:</b> Legal & Protective Services	Legal & Protective Services	<ul style="list-style-type: none"> <li>§ Public Management and Administration</li> <li>§ Governance</li> <li>§ Pre-Law</li> <li>§ Criminal Justice</li> <li>§ Humanities</li> </ul>	Criminal Justice; Legal Assistant; Government
Scientific Research, Engineering & Technical Services <b>COMBINED WITH:</b> Transportation, Distribution & Logistic Services	Engineering, Technical Services and Transportation	<ul style="list-style-type: none"> <li>§ Pre-Engineering</li> <li>§ Drafting &amp; Design</li> <li>§ Automotive Repair</li> <li>§ Transportation Operations &amp; Systems</li> <li>§ Aeronautics</li> <li>§ Mathematics &amp; Science</li> </ul>	Engineering Design Graphics; Mathematics; Chemistry; Engineering; Physics & Astronomy

\*Austin Community College. *Catalog 2003-2004, Degree Programs, page 56.*

## Career Pathways (Areas of Concentration)

A career pathway is a coherent, articulated sequence of rigorous academic and career courses, commencing in the ninth grade and leading to an associate degree, and/or an industry-recognized certificate or licensure, and/or a baccalaureate degree and beyond.

The essential characteristics for an ideal career pathway at the secondary level are that it:

- § meets state academic standards and grade-level expectations;
- § meets high school testing and exit requirements;
- § provides additional preparation to assure college readiness;
- § meets postsecondary (college) entry/placement requirements;
- § provides academic and career-related knowledge and skills in a chosen career cluster; and
- § provides opportunities for students to earn college credit through dual/concurrent enrollment or articulation agreements.

Several examples of areas of concentration mapped in six-year career pathway aligned to Austin Community College (ACC) follow the Career Cluster section of this report. These proposed pathways are based on the 24 credits required for AISD's Recommended Graduation Program and the current seven-period school day. They include a coherent sequence of courses in the area of concentration and incorporate at least six semester hours of college credit earned from dual credit courses approved for Austin Community College or another institution offering the unique program. Each pathway also offers the option for "catch-up" courses in English and mathematics during the senior year so that more students are prepared for college-level, scoring courses at high school graduation.

The coherent sequence of career courses begins in the ninth grade with the 0.5 Carnegie credit course, Support and Career Exploration. This semester course focuses on strengthening study skills and having opportunities to explore the 11 career clusters. (*See Appendix 3.*) During the semester, students will learn how to study in teams and develop their organizational time management skills. They will explore opportunities in postsecondary education and careers, participate in job shadowing, visit a college, etc., and find out how they need to prepare for these. By the end of this course, students will have prepared their focused program of study in consultation with their parents and school counselors.

Because of the high failure rates in ninth-grade English and mathematics and the substantial proportion of seniors who are not prepared for college, options for ninth-grade and 12<sup>th</sup>-grade catch-up courses in English and mathematics are necessary. For example, the mathematics catch-up course for ninth-graders would be designed to get students ready for "real" algebra. (*See Appendix 4.*) The course is for those students who are promoted to ninth grade but who are not ready for challenging work. It will serve as an elective class to focus on the essential content and process skills most needed by students to be successful in Algebra I. The ninth-grade catch-up English course (*See Appendix 4.*) is to help students attain grade-level proficiency in their courses that use literacy skills.

At the senior level, the mathematics catch-up course is to help students enter postsecondary study prepared for the first credit-bearing course in mathematics. The course is designed for those students who may have completed the mathematics credits for graduation but have not achieved at the level necessary to exit high school prepared for the next level. Students who enroll in this course probably would not have otherwise planned to take mathematics during their senior year.

### Earning College Credit Via Dual Credit Courses

Austin students can earn college credit through Advanced Placement (AP) courses, articulated credit in the statewide Advanced Technical Credit Program (ATC) and through dual credit courses. In the first two instances, students receive college credit after the fact and only if they pursue postsecondary studies. Some Tech Prep programs are included in the areas of concentration, but the district is encouraged to develop these as dual credit programs so that students may earn dual credit while in high school. **One of the assumptions of this framework is that Austin students will leave high school with at least six hours of college credit on their transcripts, and the way to accomplish this is through dual credit courses.** Thus this design focuses on dual credit courses.

According to district information,<sup>4</sup> a student qualifies for the dual credit program by meeting the following requirements:

- § Be a high school junior or senior;
- § Be limited to a maximum of two (2) college-level courses per semester;
- § Meet with an AISD counselor and an ACC advisor prior to enrolling in classes;
- § Complete the Early College Start form and obtain the necessary approvals;
- § Meet all ACC admissions requirements prior to enrolling in classes (including the TASP test);
- § Be recommended by the high school principal or their designee and have parental permission.

Because students have to meet the requirements for admissions to the partnering college which includes passing the college placement exam, passing the subject area placement tests, and/or meeting course prerequisites, students should take the placement exams during the 11<sup>th</sup> grade to determine their college readiness and, if necessary, use their senior year to beef up their skills.

In addition to requirements for students, *High Schools That Work (HSTW)* believes that AISD high school courses that would carry transcribed postsecondary credit should meet the following conditions:

- § Standards, content and student assignments as reflected in a course syllabus would be judged to be equivalent in rigor, depth and comprehension to a comparative course currently taught by the college and described in its catalog and course syllabus.

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<sup>4</sup> *Austin ISD Secondary School Information Guide, Section 1. General Information for Secondary School Students and Parents.* Austin Independent School District. 2004.

- § High school and postsecondary commonly developed end-of-course exams that would be used to assess student learning in a course whether offered to postsecondary students or offered at the high school level. Credit would be awarded to students who can meet the same standards that would be expected of students at postsecondary level. Grading may be two-tier, thus making it possible for students to earn high school credit if they do not meet the standards necessary for earning postsecondary credit. Credit would be based in part on demonstrated performance as measured by commonly end-of-course exams and may include as some type of exhibition of performance or portfolio.
- § Teachers teaching the course would meet the same qualifications and standards that the college would apply to any teacher teaching the course to postsecondary students for college credit. That means that if the college requires all of its teachers to have a master's degree for demonstrated expertise in the field of study, any high school student who earns postsecondary credit would have to be taught by such teachers. It is important to understand what the colleges' requirements are for teachers and how much flexibility they have under their accreditation standards.

One challenge to incorporating dual credit courses into the 11<sup>th</sup> - and 12<sup>th</sup> grade schedule is equating the college semester hour to the high school semester credit. The college semester course typically has about 48 contact hours compared to 75 hours in a high school semester course. For the present, the proposed pathways include four college semester courses to approach the number of contact hours in a yearlong high school course. AISD currently has 38 dual credit courses approved for Austin Community College,<sup>5</sup> but there are great inequities in matching credits from course to course. For example, students who wish to satisfy their high school credit in English IV with dual credit courses must take a total of 12 college semester hours including English Composition I, English Composition II, British Literature I and British Literature II. Yet, if they wish to earn dual credit in economics, the three-hour semester course at ACC fulfils the high school requirement of one-half credit in economics. It seems better alignment must occur in order to motivate all students to earn six credits via dual enrollment.

## Institutes

Large comprehensive high schools, i.e., schools with more than 1,000 students, have greater challenges in creating caring and personal relationships with students. One way to make large schools feel and operate like small schools is to break them down into smaller learning communities. Smaller learning communities (SLCs) “are accompanied by separateness, autonomy, and distinctiveness in the sub-school units. Smaller units of students and teachers within a school may make it easier to focus on teaching and learning.”<sup>6</sup>

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<sup>5</sup> *Austin ISD Secondary School Information Guide, Appendix B. Austin Independent School District Approved Dual Credit Courses for Austin Community College.* Austin Independent School District, 2004..

<sup>6</sup> Smaller Learning Communities (SLC). Fact Sheet Series. Secondary and Technical Education. U.S. Department of Education. Office of Vocational and Adult Education. October 2004.

One of SREB's recommendations to the district<sup>7</sup> is that it establish a high-quality career institute, i.e., a smaller learning community, at each district high school as a way to create more personalized, focused, challenging and relevant learning environments in these large schools. An institute represents a career cluster or combination of clusters. Each institute will provide at least four related academic and career concentrations. The institutes would enroll at least 250 to 300 students in grades 10 to 12 and would seek to attract a mainstream group of students with a strong interest in the career field. The following are suggestions for institutes:

- Š **Mathematics, science and pre-engineering.** Concentrations could include mathematics and science, pre-engineering, electronics and Project Lead The Way (PLTW).
- Š **Business.** The concentration areas could include business management, banking and finance and information technology.
- Š **Urban agriculture.** Areas of concentration could include environmental science, pre-veterinarian, and landscaping and design.
- Š **Health and Medical Science.** Areas of concentration would include pre-nursing, medical services and technology, emergency service, sports medicine, general medicine and mathematics and science.
- Š **Education and Human Services.** Areas of concentration would be early childhood development, elementary education, social services, protective services, humanities, and mathematics and science.
- Š **Transportation.** Areas of concentration would be automotive repair including heavy equipment and diesel engines, transportation operations and systems, and mathematics and science.
- Š **Humanities and International Business Studies .** Areas of concentration would be humanities with an emphasis in languages, culture, communications and business.

AISD already has established two institutes – one in health sciences at Lanier and one related to hospitality at Travis, but both need additional career concentration options within the broad career field and related academic courses to meet the definition of an institute and to fully prepare students for today's knowledge-based economy.

Institutes can pull concentrations from more than one career cluster and offer all students a range of concentrations that meet their interests. For example, an institute for mathematics, science and pre-engineering can pull from the Manufacturing and Construction cluster and the Engineering, Technical Services and Transportation cluster. Such an institute could include concentrations in mathematics and science, drafting and design, building construction and technology, electronics, computer programming and software development, pre-engineering, etc. See page 88 for an example of an institute.

District leaders should visit schools that have developed model institutes around a coherent sequence of rigorous academic courses within a broad career field. Descriptions of some exemplary institutes at various high schools across the country are included in the appendices of this report. (*See*

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<sup>7</sup> *Austin Independent School District Audit Review and Benchmarking Study, Final District Report.* Southern Regional Education Board, High Schools That Work, 2004.

*Appendix 5.)* Memorial High School, Houston, Texas, and Burleson High School, Burleson, Texas, are certified schools for Project Lead The Way, a rigorous pre-engineering program that Texas has certified as Advanced Technical Credit State-wide Articulated courses. Some of these are small schools that emulate an institute and focus on a broad career field. High Tech High in San Diego, California, “is founded on three design principles: personalization, adult-world connection, and a common intellectual mission. Another is New Tech High School in Napa, California. New Tech was founded in 1996 “to prepare students to excel in an information-based, technologically advanced society.” The Michael E. DeBakey High School for Health Professions in Houston, Texas, is a small high school that offers students a solid college-preparatory program that requires courses in upper level science and mathematics. Horry County’s Academy for the Arts and Sciences in Myrtle Beach, South Carolina, advances student achievement through project-based learning. Norfolk County Agricultural High School, Walpole, Massachusetts, Chicago High School for Agricultural Sciences, Chicago, Illinois, and Walter Biddle Saul High School of Agricultural Sciences, Philadelphia, Pennsylvania, focus on agricultural education and the agricultural industry.

SREB provides training in planning and organizing small learning communities. Its professional development workshop for district, school and teacher leaders, “*Using Small Learning Communities to More Deeply Implement the HSTW Design,*” is designed not only to teach the processes of planning, designing and implementing HSTW Small Learning Communities (SLCs), but also to assist school teams at various stages in these processes. Participants in this workshop are trained to return to their schools to do real work in leading their schools in implementing the principles and practices for SLCs. (*See Appendix 6.*)

To help defray some of the start-up and development expenses for institutes in Austin high schools, district leaders may wish to pursue SLC grants to help develop institutes in Austin high schools. SLC grantees are able to use funds for feasibility studies, research, professional development and implementation. In 2002, the federal government budgeted \$142 million in grant monies for large schools to plan, implement or expand smaller learning communities in within the school. **In 2004, the U.S. Department of Education returned \$25 million to the Treasury because it did not receive enough quality proposals for SLCs. It intends to issue another Request for Proposal in January 2005.**

## **Certification and Licensure**

Another recommendation in the Final District Report<sup>8</sup> is to seek external certification for all career cluster programs. Certification guarantees that both the program content and the instructors have attained high standards of excellence. For each concentration for which there are national certification standards, the programs should meet the standards and teachers should pass external exams given by industry-recognized groups. For programs offered by AISD which have no national certification exams, the district could establish a local certification process with an external review group composed of employers from the field and faculty teaching in those areas at postsecondary institutions to review the curriculum, standards, exams, labs and teacher qualifications.

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<sup>8</sup> *Austin Independent School District Audit Review and Benchmarking Study, Final District Report.* Southern Regional Education Board, High Schools That Work, 2004.

The state of Texas has drafted a certification and licensure guide<sup>9</sup> as a resource for CATE programs. It lists the certification, gives a description of the certification and shows the CATE course alignment. (See Appendix 7.) District leaders may wish to review the certification process that the state of Virginia has just completed. The Virginia objectives focus on entry-level employment for students, program improvement, verified credit for graduation, and external validation. Its Board of Education has approved a wide range of industry certifications, occupational competency assessments and licensures. (See Appendix 8.)

If the district expects students to take and pass certification exams in their areas of concentration, it may need to provide financial assistance to students who cannot afford the cost of the exams. If there is no national exam, the district will need to develop common end-of-program exams and require their use throughout the district. Common exams can be a valuable tool for determining the quality of the curriculum and instruction from school to school.

### Estimating AISD's Share of Jobs

AISD produces 1.6 percent of public high school graduates in the state of Texas and has 1.8 percent of the state's ninth- through 12<sup>th</sup>-graders. Thus, the expectation is that Austin graduates would fill approximately 1.6 percent of the new and replacement jobs in Texas. (See Table 2.)

School Characteristics	Texas	Austin	Austin % of State
Enrollment (2003) Grades 9-12	1,174,367	20,620	1.8%
Graduates (2002)	225,167	3,705	1.6%

Source: Academic Excellence Indicator System 2002-2003. [www.tea.state.tx.us](http://www.tea.state.tx.us)

### Distribution of Areas of Concentration

The framework includes three broad areas of concentration: 1) mathematics and science, 2) humanities, and 3) career and technical. The distribution of students across these three is expected to follow a 20-30-60 pattern. This distribution applied to the 3,705 seniors in AISD's class of 2002, would yield approximately 740 mathematics and science graduates, 1,110 humanities and social sciences graduates, and 2,225 graduates from career/technical concentration in broad career fields. (See Table 3.) The expectation is that some students will pursue more than one concentration, such as a concentration in mathematics and science paired with a career/technical concentration in engineering, technical services and transportation or a concentration in humanities paired with a career/technical concentration in Arts, A/V Technology and Communications. Based on this expectation, approximately 370 seniors would complete dual concentrations.

<sup>9</sup> Career and Technology Education Industry Certification and Licensure Guide. Draft. Texas Education Agency. January 2003.

A wide gap exists between the recommended and current distribution for areas of concentration. (See Table 3.) Data from the AISD 2004 Student Survey indicate that 62 percent of the Class of 2004 did not complete an area of concentration. Only five percent completed a concentration in mathematics and science compared to the goal of at least 20 percent. Only 20 percent completed a concentration in CATE courses in some broad career field compared to the goal of 60 percent.

Areas of Concentration	Recommended Distribution*	Annual Straight-line Estimate**	Distribution of Concentrations Seniors 2004 <sup>#</sup>
Mathematics/science	20%	740	5%
Humanities	30%	1,110	21
Career/technical	60%	2,225	20
No concentration	0%	0	62
<b>Total (Includes 10 percent dual concentrations)</b>	<b>110%</b>	<b>4,075</b>	<b>108%</b>
<small>*SREB's recommended distribution; **Projections are straight-line estimates based on 2002 graduates (3,705) and do not include a growth factor for enrollment or completion. Source: **Academic Excellence Indicator System 2002-2003. <a href="http://www.tea.state.tx.us">www.tea.state.tx.us</a> # AISD 2004 Student Survey.</small>			

### High-paying, High-demand Jobs

Job outlook data for the Austin area and the state of Texas are essential to developing career clusters that lead graduates to “entry-level employment in a high-skill, high wage job and continuing the student’s education at the postsecondary level.” The 10-year (2000-2010) projections of workforce needs developed by the Labor Market Information Department, Texas Workforce Commission serve as the basis for estimating job potential in each career cluster. The design will focus on top occupational titles that are projected to add or replace the most jobs during the decade and require postsecondary education, certification or licensure.

The projected annual demand for “new” and replacement jobs in Texas is factored for Austin high schools using the ratio of Austin’s graduates to the total across the state to determine job potential for Austin graduates. In 2002, 1.6 percent of the state’s graduates were from AISD high schools, so one would expect Austin graduates to capture somewhere in the neighborhood of 1.6 percent of job openings across the state. In essence, the ultimate goal is to ensure that these graduates have the knowledge and skills to fill these high-demand, high-wage jobs.

The following pages describe the framework for each of the career clusters and relevant areas of concentration. In most cases, concentrations are aligned with first-year courses offered by Austin Community College and would result in students earning at least six hours of college credit through dual enrollment. Some concentrations may be linked to programs at other postsecondary institutions because they are not offered at ACC. For example, the concentration in landscape design in the agriculture and natural resources career cluster is aligned with Texas State Technical College in Waco, because ACC does not have offer a landscaping program. Texas A & M or Sul Ross State

University is a potential partner for a pre-veterinary program Texas State Technical College also offers auto and diesel mechanics program that could complement programs at ACC.

The National Academy Foundation has academies for finance, information technology, and hospitality and tourism that could complement the local curriculum. Each cluster includes a concentration in mathematics and science and a concentration in humanities if relevant to the broad career field.

The framework for the career clusters and relevant areas of concentration includes several pieces of information:

- § Department of Education description of the cluster;
- § Proposed career cluster for AISD;
- § Texas occupational titles for high-demand jobs (Top 25) relevant to the cluster;
- § Estimated annual demand in Texas for the cluster's (Top 25) high-demand jobs;
- § Estimated number of AISD graduates for high-demand jobs in each cluster
- § AISD Fall 2003 enrollment in related CATE courses;
- § Areas of concentration proposed for the cluster; and
- § Descriptions of the coherent sequences of courses for the proposed concentrations.

Examples of areas of concentration mapped for six-year year pathway from ninth-grade to postsecondary and an example of an institute follow the section on career clusters.

Note that concentrations within clusters may have common courses.

## Career Clusters

## Cluster 1: Agriculture and Natural Resources

**Description:** Planning and managing agriculture, food, fiber, and natural resources systems. Production of agricultural commodities, including food, fiber, wood products, horticultural crops, and other plant and animal products. Financing, processing, and marketing and distribution of agricultural products; farm production and supply and service industries; horticulture and landscaping services, and the use and conservation of land and water resources; development and maintenance of recreational resources. It also includes mining and extraction operations and related environmental management services.

Top 25	Agriculture and Natural Resources – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Farmworkers	3,325	53
2	Landscaping & Groundskeeping Workers	2,545	41
3	Farmers & ranchers	2,300	37
4	Water & Liquid Waste Treatment Plant & Systems Operators	450	7
5	Farming, Fishing & Forestry workers	435	7
6	Meat, Poultry, & Fish Cutters & Trimmers	430	7
7	Farm, Ranch & Other Agricultural Managers	400	6
8	Slaughterers & Meat Packers	385	6
9	Nonfarm Animal Caretakers	370	6
10	Agricultural Equipment Operators	250	4
11	Butchers & Meat Cutters	220	4
12	Veterinary Technologists & Technicians	215	3
13	Environmental Scientists & Specialists	175	3
14	Veterinary Assistants & Laboratory animal caretakers	170	3
15	First-Line Superv./Mgrs. Landscaping, Lawn & Groundskeeping	165	3
16	Environmental Engineers	160	3
17	Environmental Science & Protection Technicians	160	3
18	Veterinarians	155	2
19	Farm Labor Contractors	150	2
20	Tree Trimmers & Pruners	135	2
21	Food Processing Workers, NEC	115	2
22	Pest Control Workers	110	2
23	Geoscientists, Hydrologists & Geographers	110	2
24	Geological & Petroleum Technicians	110	2
25	Petroleum Engineers	105	2
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>13,145</b>	<b>212</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Agriculture” (Fall 2003-2004)

<b>District Total</b>	341	Crockett	37
Akins	75	Lanier	137
Bowie	92		

## Areas of Concentration

### 1. Environmental Sciences (Coherent Sequence of Courses Aligned to ACC)

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Environmental Science.** An overview of environmental science and current global concerns, exploring scientific, economic, social and political solutions to environmental problems. Discussion of the history of the environmental movement, environmental regulatory agencies, fundamental principles of resources and their use, population, conservation, and environmental health. (Semester)

**Environmental Regulations Overview.** An introduction to the history of the environmental movement, including basic requirements for compliance with the environmental regulations. Discussion of local, state, and national regulations, ordinances, laws and court decisions relating to environmental hazards, pollution, conservation, and environmental preservation. Description of the process of permit application, compliance, and enforcement of environmental regulations. (Semester)

**Environmental Biology Lecture.** An investigation into the biological, social, political, and economic effects of overpopulation, resource depletion and pollution. Course encourages the expression of diverse opinions and critical thinking on key environmental issues. (Semester)

**Environmental Biology Lab.** A companion lab/activity course to Environmental Biology Lecture. Investigates topics in environmental biology with demonstrations, lab activities and field trips. (Semester)

**Ecology and Evolutionary Biology.** Designed for science majors and students with a strong science background who desire a more in-depth approach to biological topics. An introduction to the structures and functioning of ecological systems, including populations, communities and ecosystems. The impact of humans on the environment will also be discussed. Also includes a discussion of the principles of populations genetics, evolution and speciation. Involves field activities and techniques of field work. (Semester)

**Field Biology.** An introduction to the observation and identification of plants and animals and of the ecological associations in which they are found. Includes a consideration of the relationships of these organisms with their environment. (Semester)

**Aquatic Biology.** An overview of aquatic ecosystems and their organisms. The course will focus on learning to sample and identify aquatic plants and animals from both freshwater and marine habitats. Exercises will involve collecting and analyzing samples from both freshwater and marine ecosystems. (Semester)

**Introduction to Environmental Field Methods.** Sampling protocol, procedures, quality control, preservation and field study of surface and ground water. The emphasis is on analysis commonly performed by the field technician, especially on natural waters. Laboratory exercises will involve monitoring and sampling water wells and nearby lakes and creeks. (Semester)

### 2. Pre-veterinary (Coherent Sequence of Courses Aligned to Texas A & M Animal Sciences)

**Support and Career Exploratory** (See *Appendix 3.*)

**General Animal Science.** Scientific animal agriculture; selection, reproduction, nutrition, management and marketing of beef cattle, swine, sheep, goats and horses; evaluation and processing of meat, wool and mohair. Importance of livestock and meat industries. (Semester)

**Introductory Equine Care and Use.** Survey of basic equine care and use; breeds of horses and their use; care and maintenance of equines including feeding, health care, housing and equipment. (Semester)

**Principles of Animal Nutrition.** Scientific approach to nutritional roles of water, carbohydrates, proteins, lipids, minerals, vitamins, and other dietary components; emphasis on the comparative aspects of gastrointestinal tracts and on digestion, absorption, and metabolism of nutrients. (Semester)

**Behavior and Management of Domestic Animals.** Application of behavior of cattle, horses, sheep, goats and swine to their management; basic principles, physiology of behavior, perception, training, predators, use of dogs in livestock production, stress and animal welfare (Semester)

### **Alternative Alignment – Sul Ross State University, Alpine, Texas**

**General Animal Science.** An introductory survey course. Farm animals as a source of food, clothing, labor; the place of livestock in farming; the place of the United States and Texas in the livestock industry, heredity, the basis for improvement; selecting and judging and its importance; the place and advantage of each type of livestock, showing classification; classification of the breeds and market types of horses, beef cattle, hogs, sheep, and goats. (Semester)

**Clinical Assistance.** An introduction into the principles of restraining domestic animals. This will involve the function, principles and use of certain mechanized restraint equipment as well as the use of common knots, halters and other restraint items. Introduction into injection and inhalation anesthesia. Small animal kennel and cage management. (Semester)

**Veterinary Ethics and Clinic Procedures.** An in-depth study of laws and regulations governing veterinary medicine and the role of the veterinary technical assistants in clinic operations. (Semester)

**Small Animal Management.** A study of breeds, management, nutrition and diseases of the dog and cat. (Semester)

**Animal Anatomy/Physiology.** A basic course to teach the students the fundamentals of the structure and function of the various organ systems in the common domestic animals. (Semester)

**Behavior and Management of Domestic Animals.** An in-depth study into the basic components of animal behavior and how these principles apply to the management of domestic livestock. Special emphasis will be placed on facility design, handling techniques, stress, training and current animal welfare and ethics issues. (Semester)

### **3. Landscaping and Design (Coherent Sequence of Courses Aligned to Texas State Technical College-Waco)**

**Support and Career Exploratory** (*See Appendix 3.*)

**Principles of Horticulture.** An overview of the horticulture industry, plant science, terminology, classification, propagation, environmental responses, and careers and opportunities in the field of horticulture. (Semester)

**Native Plants.** Introduction to the flora of Central Texas. The course involves plant identification, distribution, comparisons, and discussions on the usefulness of native Texas plants. This includes medicinal, edible, and horticultural uses. Involves field trips. (Semester)

**Herbaceous Plants.** An in-depth study of herbaceous plant material. Topics include practices and procedures used in the identification, growth, propagation, maintenance, and utilization of herbaceous plants in the horticulture industry. (Semester)

**Landscape Construction.** Exploration of landscape construction materials and the methods used for installation. Topics on soil preparation, including wood, concrete, and masonry construction; and landscape lighting, including pools, spas, and general construction details. (Semester)

**Horticulture Equipment Management.** Instruction in identification and application of various types of powered equipment used in the horticulture industry. Presentation of functions, operations, troubleshooting techniques, and repair of equipment. (Semester)

**4. Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science - emphasis in biology and chemistry - with at least one AP credit in science)

**Support and Career Exploratory** (*See Appendix 3.*)

**Calculus I.** A standard first course in calculus. Topics include inequalities; functions; limits; continuity; the derivative; differentiation of elementary functions; Newton's method; applications of the derivative; the integral; integration of algebraic functions and the sine and cosine functions; numerical integration; and basic applications of the integral. (Semester)

**Calculus II.** A standard second course in calculus. Topics include integration of elementary functions; techniques of integration; integrals with infinite limits of integration; integrals of discontinuous integrands; applications of the definite integral; an introduction to differential equations; infinite series; analytical geometry; and other applications. (Semester)

**Cellular and Molecular Biology.** General Biology course designed for science majors and students with a strong science background who desire an in-depth approach to biological topics. An introduction to the physical and chemical organization of living organisms; cell structure, function, and metabolism; classical and molecular genetics; gene regulation; genetic engineering; molecular aspects of development; and reproduction. (Semester)

**Structure and Function of Organisms.** General Biology course designed for science majors and students with a strong science background who desire an in-depth approach to biological topics. An introduction to the diversity, anatomy, physiology, reproduction, development, behavior, and evolution of living organisms. Includes viruses, prokaryotes, protists, fungi, plants, and animals. (Semester)

**General Chemistry I.** Covers the fundamental facts, laws, principles, theories, and concepts of chemistry necessary for further work in science or science-related subjects. Stresses atomic structure, periodic properties of matter, chemical bonding, and molecular geometry of organic and inorganic molecules, states of matter, stoichiometry, and properties of solutions. (Semester)

**General Chemistry II.** Stresses the quantitative aspects of kinetics, chemical equilibria, acid-base theories, coordination complexes, thermodynamics, and electrochemistry. Includes introductions to organic chemistry and nuclear chemistry. (Semester)

## Degree Opportunities at Austin Community College

Environmental Science & Technology (A.S)  
Environmental Studies (A.A.S)  
General Studies in Science (A.S.)  
Geology (A.S.)  
Pre-Veterinary (A.S.)

## Certifications

Texas Nursery & Landscape Association (Certification) [www.txnla.org](http://www.txnla.org)  
Texas Certified Veterinary Assistant [www.tvma.org](http://www.tvma.org)  
Pesticide Private Applicators License [www.agr.state.tx.us/pesticie/wpact.htm](http://www.agr.state.tx.us/pesticie/wpact.htm)  
National Occupational Competency Testing Institute (NOCTI)  
*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 2: Arts, A/V Technology and Communications

**Description:** Designing, producing, exhibiting, performing, writing, and publishing multimedia content including visual and performing arts and design, journalism, and entertainment services

Top 25	Arts, A/V Technology and Communications – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Graphic Designers	425	7
2	Library Technicians	425	7
3	Library Assistants, Clerical	420	7
4	Actors	380	6
5	Public Relations Specialists	365	6
6	Librarians	360	6
7	Editors	295	5
8	Musicians & Singers	285	5
9	Technical Writers	245	4
10	Public Relations Managers	225	4
11	Desktop Publishers	185	3
12	Photographers	185	3
13	Art & Design Workers,	165	3
14	Photographic Processing Machine Operators	130	2
15	Producers & Directors	120	2
16	Entertainers and Performers, Sports & Related Workers,	120	2
17	Multi-Media Artists & Animators	115	2
18	Writers & Authors	110	2
19	Music Directors & Composers	110	2
20	Media and Communication Equipment Workers,	110	2
21	Public Address System & Other Announcers	105	2
22	Media & Communication Workers,	100	2
23	Proofreaders & Copy Markers	100	2
24	Audio & Video Equipment Technicians	90	1
25	Broadcast Technician	70	1
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>5,240</b>	<b>88</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Arts, A/V Technology and Communications” (Fall 2003-2004)

<b>District Total</b>	2431	Johnston	45
Akins	458	LBJ	115
Anderson	117	Lanier	11
Austin	224	McCallum	125
Bowie	456	Reagan	54
Crockett	254	Travis	572

## Areas of Concentration

### 1. Communications

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Mass Communications.** A survey of the basic factors affecting human communication, including theories and models of communication. In-depth study of the relationship of mass media and society. An overview of trends in newspapers, radio, television, film, and books, and the related institutions of advertising, public relations, and photography. (Semester)

**Copy Editing.** A study of copy editing for errors of fact and expression with emphasis on editing for readability, headline writing, and page make-up. (Semester)

**News Reporting I.** Gathering and writing news stories for newspapers, newsmagazines, and newsletters. Study of news writing techniques and appeal to reader interest. (Semester)

**News Reporting II.** Gathering and writing advanced news stories for newspapers, news-magazines, and newsletters. Interviewing techniques for specialized writing assignments (e.g., science, law, drama, literary criticism, music). (Semester)

**Technical & Business Writing.** Principles, techniques, and skills needed to conduct scientific, technical, or business writing. Instruction in the writing of reports, letters, and other exercises applicable to a wide range of disciplines and careers. Emphasis on clarity, conciseness, and accuracy of expression. Research techniques, information design, effective use of graphics, and preparation and presentation of oral reports will be covered. (Semester)

### 2. Visual Arts/Graphic and Commercial Arts

**Support and Career Exploratory** (See *Appendix 3.*)

**Basic Graphic Design.** A study of two-dimensional (2-D) design with emphasis on the visual communication design process. Topics include basic terminology and graphic design principles. Introduction to the fundamentals of design that lead to the discovery and comprehension of the visual language. Form, balance, structure, rhythm, and harmony are studied in black and white and in color. Various media are used. Foundation laid for advanced courses in design. (Semester)

**Basic Animation.** Examination of concepts, characters, and storyboards for basic animation production. Emphasis on creating movement and expression utilizing traditional or electronically generated image sequences. An introduction to traditional animation; course includes design, storyboarding, stop-motion and character animation. Gives students a working knowledge of animation techniques necessary to design animated sequences. (Semester)

**Digital Imaging I .** Digital imaging using raster image editing and/or image creation software: scanning, resolution, file formats, output devices, color systems, and image-acquisitions. (Semester)

**Basic Illustration.** Introduction to drawing techniques, skills, and concepts using various black and white media. Emphasis on perspective construction of the human figure and principles of shading as they pertain to the illustration industry. Introduction to drawing skills using various media. Includes study of one and two point perspective, fundamental construction of the human head figure, and the

principles of shading. Emphasizes natural and technical drawing, and working in both the studio and the outdoor environment. Foundation laid for advanced courses in illustration. (Semester)

**Digital Publishing I.** An introduction to the fundamentals of using the computer as a primary production tool. Topics include an overview of industry standard software for page layout and design, drawing and image manipulation, and various methods of reproduction for print and electronic delivery. An introduction to QuarkXPress and Illustrator, and other tools and skills used to prepare electronic pre-press art for print reproduction with a goal of economy, neatness and faithfulness to the designer's layout or written instructions. Material covered will include graphic terminology, type specification, and evolution of the printed piece from concept to final printed project. (Semester)

**Design Communication I.** Study of design development relating to graphic design terminology, tools and media, and layout and design concepts. Topics include integration of type, images and other design elements, and developing computer skills in industry standard computer programs. Study of design development pertaining to color theories, publications, and advertising. Projects will emphasize relating form to content through selection, creation and integration of typographic, photographic, illustrative and design elements. Building on computer skills by executing all concepts using QuarkXPressT, IllustratorT and PhotoShopT. (Semester)

**Storyboard.** Introduction to the technique of storyboarding including organizing a project's content and arranging it in a visual format. (Semester)

### 3. Performing Arts (Students would choose an emphasis in drama, music or dance.)

**Support and Career Exploratory** (See *Appendix 3.*)

#### DRAMA Emphasis

**Introduction to Theatre.** A general survey of theater including exploration of dramatic literature, theory, and criticism; production arts, skills, and crafts; and theater history from 500 BC to the present. Course requires good reading and writing skills. (Semester)

**Stage Movement.** Principles, practices, and exercises in body techniques and stage movement; emphasis on character movement and body control. (Semester)

**Stagecraft.** Basic skills and techniques of theatrical mounting. Materials and principles of scene construction and painting, properties, and stage lighting. Participation on technical crews required. (Semester)

**Stage Make-Up.** The design and execution of make-up for the purpose of developing believable characters. Focus on basic makeup principles and experience with makeup application. (Semester)

**Acting I.** Basic skills and techniques of acting, including increased sensory awareness, ensemble and solo performing, character analysis, and script analysis. Development of stage presence and characterizations through improvisations and scenes. (Semester)

**Acting II.** A study of the process of creating the dramatic character from text to performance with emphasis on scene study and audition techniques. (Semester)

## MUSIC Emphasis

**Music Appreciation.** A foundation course for enjoyment and understanding of music through use of recorded music and song literature. Elements of music and analysis of music form and design and its relation to other subjects and activities. (Semester)

**Music Literature I.** A survey of principal forms, styles, and periods through the study of representative composers and works. Emphasis is on the music from Antiquity through the Baroque. (Semester)

**Music Literature II.** A continuation of Music Literature I. Emphasis is on the music of the Classical, Romantic, and Modern periods. (Semester)

**Music Theory I.** A review of the fundamentals of music; part writing and figured bass exercises, melody harmonizations, dominant seventh chords, and non-harmonic tones. (Semester)

**Sight-Singing and Ear Training I.** A basic aural, visual, and vocal experiences in dictation and singing at sight. (Semester)

## DANCE Emphasis

**Ballet I.** An introduction to the fundamentals of classical ballet designed for the student with little or no training. Primary emphasis on placement and alignment of the body, turnout, stretches, barre work, simple adagio and allegro movements, brief history and French terminology, as well as other preparatory work necessary for the establishment of a basic technical foundation. (Semester)

**Ballet II.** A continued study of the technical fundamentals of classical ballet. Designed for the student with at least one semester of previous ballet training. Primary emphasis on sequence combinations of beginning ballet movements, positions of the body, vertical posture, centering coordination of *port de bras* with adagio and allegro movements and continuation of French terminology. (Semester)

**Jazz Dance I.** Introductory course designed for the student with little or no previous training. Primary emphasis on jazz dance technique; placement and alignment of the body, footwork, stretches, musicality and other preparatory work necessary for establishment of a basic technical foundation. Different styles of jazz dance such as musical theatre, show style, Broadway, funky jazz, television and movie styles are explored. (Semester)

**Jazz Dance II.** Designed for the student with at least one semester of previous jazz dance training. Primary emphasis on jazz dance techniques; placement and alignment of the body, footwork, stretches, turns, musicality and other work necessary for continued growth in jazz technique. Work on developing each dancer's unique style will be emphasized. (Semester)

**Principles of Choreography.** An introduction to the basic principles of composition and choreography with emphasis on the study, design, and evaluation of compositional forms. (Semester)

**Modern Dance I.** Introductory course in the fundamentals of modern dance technique. Students learn and practice warm-up exercises and dance sequences emphasizing articulation and coordination of body parts, rhythm, musicality and expressive qualities of movement. (Semester)

**History and Appreciation of Dance.** An introductory survey course in the history and development of primitive, classical, and contemporary dance forms. Involves a study of stylistically authentic dances from several of the major periods based on research and films. (Semester)

## 4. A/V Technologies

**Support and Career Exploratory** (See *Appendix 3*.)

**Fundamentals of Photography.** An introduction to film exposure and development, basic enlarging, composition, darkroom technique, flash usage, and use of exposure meters and filters for black and white. Study and practice of lighting forms, posing, ratios, and exposure determination in the studio. Student may be required to use some outside commercial lab services. Students must furnish acceptable adjustable 35mm camera unless course is a requirement of another major. (Semester)

**Introduction to Radio And Television.** A survey of the principles and trends involved in radio and television broadcasting, cable, and the other electronic media, including programming, regulation, business practices, and international telecommunications. Activities in analyzing various types of radio and television programs. (Semester)

**Introduction to Television Technology.** Selection and application of production supplies and equipment. Digital and analog signal concepts and their use in production and the theory, application, and internal operation of television production equipment. (Semester)

**Audio Production.** A basic course dealing with the fundamentals of audio recording production for radio, television, and film. Includes production of public service announcements, commercials, radio news, and dramatic spots. (Semester)

**Television Production I.** A study of basic television production as it applies to live studio programming. Beginning instruction is offered in areas of studio camera operation, audio for television, and television directing, with an emphasis on underlying principles of video technology. (Semester)

**Television Production II.** An advanced study of television production from the studio and field production perspective, with emphasis on producing and directing a variety of programs. Student will be required to provide scripts for programs to be produced in class. Experience in video editing will be gained. (Semester)

## 5. Concentration in Humanities (Four or more credits drawn from foreign language, fine arts, journalism, debate or advanced-level courses in literature, history, economics psychology or another humanities area)

**Support and Career Exploratory** (See *Appendix 3*.)

**AP English III.** AP Language and Composition emphasizes the analysis of a variety of literary and nonfiction texts with particular attention to the writer's style, diction, syntax, argumentation and logic. Students reflect this analysis in compositions that use sophisticated syntax and vocabulary, effective use of proof, and control of the conventions of language. Emphasis is on wide reading and fluent response in timed essays in preparation for the Advanced Placement Examination in Language and Composition. (Yearlong)

**AP English IV.** Using college level expectations, this course emphasizes wide reading and analysis of world literature including fiction, nonfiction and poetry. Students analyze literary elements and writer's style related to purpose, audience and theme. Literature analysis will also be a major focus of the composition strand. Students will use proof, voice and advanced syntax and vocabulary in

compositions written on demand and using writing process. Students prepared to complete the Advanced Placement Examination in English Literature and Composition. (Yearlong)

**Creative Writing.** Instruction in literary writing: prose, poetry, screenwriting and drama. Topics may vary. Possible markets for creative writing to be discussed. (Semester)

**Oral Interpretation III (Honors)** Students create oral performances with self-selected pieces of literature as communication art. They select, research, analyze, adapt, interpret and perform literary texts. Individual and group performances of literature will be presented and evaluated. In advanced classes, students will be required to complete long-term teacher-directed projects. Many students will also participate in competitions. (Yearlong)

### **Options for Languages with Dual or AP Credit (French, German, Japanese, Latin and Spanish)**

**French I.** Study of fundamentals of French: conversation, basic writing, listening and reading comprehension, vocabulary building, grammar, and culture. It is highly recommended that students with no previous experience with a foreign language also enroll in a French I Lab course. (Already approved as dual credit course.)

**French II.** Continuation of French I with more advanced conversation, basic writing, listening and reading comprehension, vocabulary building, grammar, and culture. (Already approved as dual credit course.)

**AP French IV.** This course prepares students for the College Board AP French Language examination, which consists of multiple-choice questions in reading and listening and free-response questions in writing and speaking. The AP French examination evaluates both understanding and the ability to respond to written and spoken French. (Yearlong)

**AP History of Art.** This introductory art history course provides an opportunity to understand and enjoy architecture, sculpture, painting and other art forms within historical and cultural contexts. Students will examine the major forms of artistic expression of the past and present in a variety of cultures. Although no prior experience is needed, the course does require a high degree of commitment to academic work to meet college standards. (Yearlong)

**AP Music Theory.** Students will be required to master fundamentals and vocabulary of music involving notation, ear training, sight singing, harmonic and melodic dictation, and form analysis. Class keyboard and/or guitar lessons are included. Students enrolled in this course should have a keyboard instrument readily available for practice and assignments. (Yearlong)

**AP Psychology.** AP Psychology is a college-level introduction to the concepts and methods of psychology. The course content is presented in depth and at an accelerated pace. Students learn the principal theories of psychology and study factors that affect human behavior and development, perception and learning, memory and thought, motivation and emotion, personality disorders; and related topics. (Semester)

**AP United State History.** AP U.S. History is a college-level survey of U.S. history from the Exploration to the present. The course content is presented in depth and at an accelerated pace. It includes a study of methods of historical analysis, college-level readings, document analysis, and interdisciplinary research and writing projects. (Yearlong)

**AP European History.** AP European History is a college-level survey of European history since 1450. The course emphasizes intellectual-cultural, political-diplomatic, and social-economic history. The

content is presented in depth and at an accelerated pace. It includes the methods of historical analysis, college-level readings, document analysis and interdisciplinary research and writing projects.

**AP World History.** AP World History is a college-level survey of world history from early times to the present. The course emphasizes intellectual-cultural, political-diplomatic, and social-economic history. The content is presented in depth and at an accelerated rate. It includes the methods of historical analysis, college-level reading, document analysis, and interdisciplinary research and writing project. (Yearlong)

**AP Macroeconomics.** AP Macroeconomics is a college-level introduction to the principles of macroeconomics – the study of national economic systems. It includes Classical and Keynesian analysis of aggregate supply and demand and other issues in the U.S. economy such as fiscal and monetary policy, international trade, inflation, employment, and growth and productivity in the economy as a whole. Students use the methods of economics, college-level readings, data analysis and formal research and writing projects to prepare for the Advanced Placement exam. (Semester)

**AP Microeconomics.** AP Microeconomics is a college-level introduction to the principles of microeconomics – the study of businesses and markets. Students study fundamental economic concepts such as supply, demand, price, opportunity cost, exchange and issues that influence individual and business decision-making. Students use the tools and methods of economic analysis, college-level readings, data analysis, and formal research and writing projects to prepare for the Advanced Placement exam. (Semester)

## **Degree Opportunities at Austin Community College**

Art (A.A.)  
Creative Writing (A.A.)  
Digital Publishing (A.A.S)  
Drama (A.A.)  
Journalism (A.A.)  
Music (A.A.)  
Photographic Technology (A.A.S)  
Radio-Television-Film (A.A.)  
Technical Communications (A.A.S.)  
Visual Communication Design (A.A.S)

## **Certifications**

Industrial Video (Certificate)  
Industrial Video Production Management (Certificate)  
Photographer's Assistant (Certificate)  
Photographic Artist (Certificate)  
Macromedia Certified Dreamweaver Developer (Certificate)  
Microsoft Office Specialist (Certificate)  
*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 3: Business, Finance and Marketing

**Descriptions:**

**Business Administration:** Planning, managing, and providing administrative support, information processing, accounting, and human resource management services and related management support services.

**Financial Services:** Planning, managing and providing banking, investment, financial planning, and insurance services.

**Marketing:** Planning, managing and performing wholesaling and retailing services and related marketing and distribution support services including merchandise/product management and promotion

Top 25	Business Administration – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Office Clerks, General	6,855	110
2	General & Operations Managers	6,150	98
3	Stock Clerks & Order Fillers	4,905	78
4	Receptionists & Information Clerks	3,685	59
5	First-Line Supervisors/Managers of Office & Administrative Support Workers	3,380	54
6	Executive Secretaries & Administrative Assistants	3,305	53
7	Chief Executives	2,720	44
8	Secretaries, Ex Legal, Medical, & Executive	2,105	34
9	Business Operations Specialists,	1,835	29
10	Managers	1,735	28
11	Management Analysts	1,325	21
12	Administrative Services Managers	1,145	18
13	File Clerks	900	14
14	Secretaries, Administrative Assistants, & Other Office Support Workers,	730	12
15	Human Resources Assistants, Ex Payroll & Timekeeping	545	9
16	Switchboard Operators, Including Answering Service	510	8
17	Data Entry Keyers	445	7
18	Order Clerks	440	7
19	Purchasing Managers	335	5
20	Office Machine Operators, Ex Computer	255	4
21	Operations Research Analysts	235	4
22	New Accounts Clerks	200	3
23	Telephone Operators	155	2
24	Procurement Clerks	145	2
25	Coin, Vending, & Amusement Machine Servicers & Repairers	110	2
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>44,150</b>	<b>705</b>

Source: Texas Workforce Commission. *Texas Workforce Long-Term Projections: 2000-2010.*

Top 25	Financial Services and Accounting Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Cashiers	13,080	209
2	Bookkeeping, Accounting, & Auditing Clerks	2,375	38
3	Accountants & Auditors	2,060	33
4	Bill & Account Collectors	1,785	29
5	Financial Managers	1,630	26
6	Tellers	1,450	23
7	Billing & Posting Clerks & Machine Operators	985	16
8	Interviewers, Ex Eligibility & Loan	675	11
9	Claims Adjusters, Examiners, & Investigators	595	10
10	Financial Specialists,	555	9
11	Cost Estimators	530	8
12	Securities, Commodities, & Financial Services Sales Agents	520	8
13	Financial Analysts	490	8
14	Payroll & Timekeeping Clerks	460	7
15	Loan Officers	430	7
16	Financial, Information, & Record Clerks,	425	7
17	Personal Financial Advisors	365	6
18	Compensation & Benefits Managers	325	5
19	Insurance Claims & Policy Processing Clerks	320	5
20	Compensation, Benefits, & Job Analysis Specialists	310	5
21	Appraisers & Assessors of Real Estate	220	4
22	Tax Preparers	205	3
23	Tax Examiners, Collectors, and Revenue Agents	185	3
24	Credit Analysts	165	3
25	Budget Analysts	160	3
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>30,300</b>	<b>486</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

Top 25	Marketing – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Retail Salespersons	14,450	231
2	Customer Service Representatives	7,510	120
3	Sales Representatives, Wholesale & Manufacturing, Ex Technical & Scientific Products	3,110	50
4	First-Line Supervisors/Managers of Retail Sales Workers	2,740	44
5	Telemarketers	2,295	37
6	Counter & Rental Clerks	2,165	35
7	Sales Managers	1,615	26
8	Sales & Related Workers	1,590	25
9	Insurance Sales Agents	930	15
10	Marketing Managers	775	12
11	Sales Representatives, Wholesale & Manufacturing, Technical & Scientific Products	775	12
12	Purchasing Agents, Ex Wholesale, Retail, & Farm Products	680	11
13	Parts Salespersons	660	11
14	First-Line Supervisors/Managers of Non-Retail Sales Workers	600	10
15	Real Estate Sales Agents	595	10
16	Market Research Analysts	410	7
17	Demonstrators & Product Promoters	370	6
18	Sales Representatives, Services,	325	5
19	Advertising & Promotions Managers	315	5
20	Advertising Sales Agents	305	5
21	Sales Engineers	290	5
22	Wholesale & Retail Buyers, Ex Farm Products	255	4
23	Merchandise Displayers & Window Trimmers	90	1
24	Door-To-Door Sales Workers, News & Street Vendors, & Related Workers	25	0
25	Survey Researchers	25	0
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>42,875</b>	<b>687</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

## AISD CATE Enrollment “Business and Administrative Services” (Fall 2003-2004)

	<u>General Business Studies</u>	<u>Finance</u>	<u>Marketing/Sales</u>
<b>District Total</b>	3333	140	381
Akins	234	20	46
Anderson	368	24	96
Austin	583	0	25
Bowie	228	29	41
Crockett	359	26	34
Johnston	285	0	0
Lanier	449	20	63
LBJ	0	0	0
McCallum	374	0	39
Reagan	345	21	0
Travis	108	0	37

### Areas of Concentration

#### 1. Management

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction To Business.** A general survey of the entire field of business and management in the free enterprise system. Concepts of business and management functions, organizational considerations, and decision-making processes. Explores areas of specialization in the business world. (Semester)

**Principles of Management.** Management theories and analysis of basic management functions: planning, organizing, staffing, directing, and controlling for establishing and accomplishing business objectives. Case studies are utilized. (Semester)

**Principles of Macroeconomics.** Deals with consumers as a whole, producers as a whole, the effects of government spending and taxation, and the monetary policy of the Federal Reserve. Macroeconomics is concerned with unemployment, inflation and the business cycle. (Semester)

**Business Ethics.** Topics address ethical issues, the development of a moral frame of reference and the need for an awareness of social justices in management practices and business activities. A review of ethical responsibilities and relationships between organizational departments, divisions, executive management, and the public. (Semester) **OR Business Law I.** The legal and social environment of business; contracts; personal property and bailments; and sales. (Semester)

#### 2. International Business and Marketing

**Support and Career Exploratory** (See *Appendix 3*.)

**Principles of Marketing.** Introduction to basic marketing functions; identification of consumer and organizational needs; explanation of economic, psychological, sociological, and global issues; and description and analysis of the importance of marketing research. (Semester)

**International Marketing.** Analysis of international marketing strategies using market trends, costs, forecasting, pricing, sourcing, and distribution factors. Development of an international export/import marketing plan. (Semester)

**Principles of Macroeconomics.** Deals with consumers as a whole, producers as a whole, the effects of government spending and taxation, and the monetary policy of the Federal Reserve. Macroeconomics is concerned with unemployment, inflation and the business cycle. (Semester)

**Principles of Imports-Exports I.** This is a study of export management processes and procedures. Topics include governmental controls, licensing of products, documentation, commercial invoices, and traffic procedures. Students examine the application of export principles to human and public relations, management of personnel, finance and accounting procedures. (Semester)

**Introduction to International Business And Trade.** The techniques for entering the international marketplace. Emphasis on the impact and dynamics of sociocultural, demographic, economic, technological, and political-legal factors in the foreign trade environment. Topics include patterns of world trade, internationalization of the firm, and operating procedures of the multinational enterprise. (Semester)

### 3. Marketing, Sales and Retailing

**Support and Career Exploratory** (See *Appendix 3.*)

**Principles of Marketing.** Introduction to basic marketing functions; identification of consumer and organizational needs; explanation of economic, psychological, sociological, and global issues; and description and analysis of the importance of marketing research. (Semester)

**Principles of Retailing.** Introduction to the retailing environment and its relationship to consumer demographics, trends, and traditional/nontraditional retailing markets. The employment of retailing techniques and the factors that influence modern retailing. (Semester)

**Principles of Salesmanship.** Principles of personal salesmanship including methods and tasks applicable to a wide variety of industries and commercial settings. (Semester)

**Principles of Advertising.** Fundamentals of Advertising including marketing theory and strategy, copy writing, design and selection of media. (Semester)

**Customer Relations.** Topics address general principles of customer service including skills, knowledge, attitudes, and behaviors pertinent to the professional development of the student. (Semester)

**Principles of Microeconomics.** Deals with the interactions between individual households and business firms. The concepts of supply and demand will be studied; students will learn what these concepts mean, how they operate, and how prices are determined. Market structure, market failure and income distribution will also be considered. (Semester)

### 4. Financial Management and Banking

**Support and Career Exploratory** (See *Appendix 3.*)

**Principles of Finance.** Survey of financial dynamics of the business firm. Study of monetary and credit theory, cash inventory, capital management, and consumer and government finance with emphasis on the relationship of time to money. Stresses initial & follow-up considerations in financing a business. (Semester)

**Personal Finance.** Personal and family accounts, budgets and budgetary control, bank accounts, charge accounts, borrowing, investing, insurance, standards of living, renting and homeownership, and wills & trusts plans. (Semester)

**Principles of Financial Accounting.** An introduction to financial accounting concepts and the communication of financial information to external users. Examines the accounting process, transaction analysis, asset and equity accounting, financial statement preparation and analysis, and related topics. (Semester)

**Investments.** An overview of the theory and mechanics of business investment decisions and management of business financial assets using quantitative management techniques. Topics include time value of money, cash flow, capital budgeting, sources of funds, break-even analysis, and investment decisions. (Semester)

**Loan Origination and Quality Control.** An introduction to the mortgage loan application process. Topics include regulatory compliance and documentation; real estate contracts; the mortgage application process, interview techniques; credit, income and property qualification, quality controls and procedures. (Semester)

### **Alternative Alignment – National Academy Foundation’s Academy of Finance** **(<http://www.naf.org>)**

*The Academy of Finance (AOF) prepares students for post-secondary education and careers through academic learning and hands-on work experiences within an industry-themed curriculum. Students are introduced to the broad career opportunities of the financial services industry, creating new options for the future. The Academy of Finance curriculum is developed with leading representatives from industry and education to ensure that courses are both current and relevant. By integrating necessary workplace skills in the classroom, students come to understand the connection between academic learning and career success.*

#### **Finance (Four terms required)**

**Economics and the World of Finance.** This is a one-semester course in macro and microeconomics that provides an understanding of how our market economy functions in a global setting. It provides students with a survey of economic concepts including all of the twenty-two basic principles recommended by the National Council on Economic Education. In addition, a unit on capital markets acquaints students with the role that markets and securities play in our overall economic framework.

**Banking and Credit.** This is a one semester course presents a survey of the principles and practices of banking and credit in the United States. The students learn about the major functions of banks and other depository institutions, in-house operations and procedures, central banking through the Federal Reserve System and modern trends in the banking industry. The credit component provides an overview of credit functions and operations including credit risk evaluation, loan creation and debt collection. This course culminates in the Fed Challenge project.

**Financial Planning.** This is a one-semester course that introduces students to the financial planning process and the components of a comprehensive financial plan. Students learn how to prepare a financial plan that includes saving, investing, borrowing, risk management (insurance), and retirement and estate planning.

**Securities.** This is a one-semester course focusing on the roles and functions of a modern securities organization. Through a study of the structure of brokerage firms, the trading process, credit and margin practices, automated processes, and government regulations, students gain an understanding of how a securities firm services its customers and plays an important role in our economy. Students are given the opportunity to relate their knowledge of economics, accounting, and data processing to the operations areas of various sectors of the securities industry. Emphasis is placed on the skills and attitudes necessary for success in business and college.

**Insurance.** This is a one-semester course that introduces students to various elements of the insurance

## 5. Accounting

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Accounting I.** A study of analyzing, classifying, and recording business transactions in a manual and computerized environment (Peachtree). Emphasizes an understanding of the complete accounting cycle, preparation of basic financial statements, bank reconciliations, and payroll. (Semester)

**Introduction to Accounting II.** A continuation of the first course with emphasis on merchandising transactions, notes payable and receivable, valuation of receivables and equipment, and valuation of inventories in a manual and computerized environment; continued mastery of accounting software. (Semester)

**Principles of Financial Accounting.** An introduction to financial accounting concepts and the communication of financial information to external users. Examines the accounting process, transaction analysis, asset and equity accounting, financial statement preparation and analysis, and related topics. (Semester)

**Introduction to Computerized Accounting.** Introduction to utilizing the computer in maintaining accounting records, making management decisions, and processing common business applications with primary emphasis on a general ledger package (QuickBooks). Develops further skills in maintaining accounting records, provides in-depth exposure to accounts receivable/accounts payable, payroll and inventory modules. (Semester)

**Mathematics for Business and Economics.** A course in finite mathematics for business students including sets, basic algebraic properties, linear equations and inequalities, functions and graphs, the exponential and logarithmic functions, the mathematics of finance, systems of linear equations and matrices, linear inequalities and linear programming, the simplex method, and an introduction to probability. (Semester)

## 6. Office Administration

**Support and Career Exploratory** (See *Appendix 3.*)

**Administrative Office Procedures I.** Study of current office procedures including telephone skills, time management, travel and meeting arrangements, mail processing, and other duties and responsibilities in an office environment.

**Business Communications I.** Introduction to a practical application of basic language usage skills with emphasis on fundamentals of writing and editing for business. Access to business communications web site and on-line study guide helps students develop their English skills with additional emphasis on spelling and vocabulary.

**Business Machine Applications Data Entry.** Skill development in the operation of machines used in a business environment. Emphasis on the development of skills in using computer keypad, electronic calculators and other office machines such as fax, telephone equipment, and reprographics. Coursework consists of skill development in ten-keypad on the computer and data entry applications.

**Machine Transcription I.** Skill development in mailable business document production using computers and dictation equipment. Skill refinement in grammar and punctuation with emphasis on proofreading and formatting.

**Document Formatting and Skillbuilding - Ms Word II.** A continuation of keyboarding skills in document formatting, speed, and accuracy. Emphasis on proofreading, editing, and following instructions, and keying documents from various copy.

**Introduction to Presentation Graphics -- PowerPoint.** Instruction in the utilization of presentation software to produce multimedia presentations for course work, professional purposes, and personal use. Graphics, text, sound, animation and/or video may be used in presentation development. This course covers the required skill sets on the Microsoft Office Specialist (MOS) core and expert exams.

**Administrative Office Procedures II.** Advanced office applications with special emphasis on decision making, goal setting, management theories, and critical thinking. Use of corporate intranet and office simulation is included to develop knowledge of internet, corporations, and integrated software applications.

**Administrative Systems: Office Management.** Experience in project management and office procedures utilizing integration of previously learned skills. Emphasis is placed on management functions, decision making by analyzing cases, and business communication by using PowerPoint in individual and team presentations.

7. **Concentration in Humanities** (Four or more credits drawn from foreign languages, fine arts, journalism, debate or advanced-level courses in literature, history, economics, psychology or another humanities area) If a student has a career interest in management, marketing or international business, a concentration in humanities provides a strong foundation. The emphasis would be in economics, psychology, languages and culture.

**Support and Career Exploratory** (See *Appendix 3.*)

8. **Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science - with emphasis in mathematics and statistics -- with at least one AP credit in mathematics) If a student has a career interest in banking, finance or accounting, a concentration in mathematics and science provides a strong foundation. The emphasis would be in mathematics and statistics, rather than science.

Support and Career Exploratory (See *Appendix 3.*)

### **Degree Opportunities at Austin Community College**

Business Administration (A.A.)  
Business Administration (A.S.)  
Commercial Music Management (A.A.S)  
Management (A.A.S.)  
Office Administration (A.A.S)  
Accounting (A.A.S)  
Economics (A.A.)  
Financial Management/Mortgage Banking (A.A.S)  
Fashion Merchandising (A.A.S.)  
Marketing (A.A.S.)

### **Certifications**

Administrative Assistant Certificate  
Office Assistant Certificate  
Software Applications Specialist Certificate  
Office Proficiency Assessment Certification  
Microsoft Office Specialist Certification

*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 4: Education and Training Services

**Description:** Planning, managing and providing education and training services, and related learning support services including.

Top 25	Education and Training – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Elementary School Teachers, Ex Special Education	5,675	91
2	Secondary School Teachers, Ex Special & Vocational Education	4,980	80
3	Teacher Assistants	4,215	67
4	Teachers, Primary, Secondary, & Adult,	2,555	41
5	Middle School Teachers, Ex Special & Vocational Education	2,485	40
6	Education Administrators, Elementary & Secondary School	930	15
7	Postsecondary Teachers,	885	14
8	Educational, Vocational, & School Counselors	860	14
9	Preschool Teachers, Ex Special Education	745	12
10	Special Education Teachers, Preschool, Kindergarten, & Elementary School	735	12
11	Training & Development Specialists	730	12
12	Vocational Education Teachers, Secondary School	515	8
13	Vocational Education Teachers, Postsecondary	440	7
14	Kindergarten Teachers, Ex Special Education	430	7
15	Education Administrators, Postsecondary	350	6
16	Training & Development Managers	320	5
17	Graduate Teaching Assistants	315	5
18	Instructional Coordinators	310	5
19	Special Education Teachers, Secondary School	290	5
20	Health Specialties Teachers, Postsecondary	280	4
21	Education Administrators, Preschool & Child Care Center/Program	260	4
22	Special Education Teachers, Middle School	250	4
23	Self-Enrichment Education Teachers	230	4
24	Biological Science Teachers, Postsecondary	215	3
25	Business Teachers, Postsecondary	175	3
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>29,175</b>	<b>468</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Education and Training” (Fall 2003-2004)

<b>District Total</b>	<b>72</b>
Akins	22
Crockett	41
Reagan	9

## Areas of Concentration

### 1. Teacher Cadet and Education

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Psychology.** Survey of introductory topics such as learning, memory, sensation and perception, personality, life-span development, physiological basis of behavior, stress and health, psychological disorders, social psychology, and research methods. Additional topics such as language development, states of consciousness, and psychotherapy may also be included. (Semester)

**Schools and Society.** An integrated pre-service course and content experience for those interested in a teaching career. The course will provide active recruitment and support for those interested in a teaching career, field experiences, and support from college and school faculty for the purpose of introducing and analyzing the culture of schooling and classrooms from a variety of perspectives. (Semester)

**Child Growth and Development Through Adolescence.** An intensive study of child growth, development, and learning processes from conception through adolescence. Theories and research methods related to biological, cognitive, emotional, and social development will be studied. The focus will be on the application of these theories and research findings into real-life settings and broader social contexts. (Semester)

**Special Topics in Early Childhood Education and Teaching.** An in-depth study of the attitudes and behaviors pertinent to early childhood and to the student's professional development. Emphasis is placed on using developmentally appropriate practices in planning and teaching; professional ethics; building collaborative relationships with colleagues and families; and being a reflective teacher. (Semester)

**The School Age Child.** A study of age appropriate child care programs for children 5 to 13 years old. Topics covered include an overview of school age development, developmentally appropriate environments, activities, planning and teaching techniques appropriate for school age children. Weekly observations of school age children are required. (Semester)

**Family and Community.** A study of the relationship between the child, the family, the community, and educators, including parent education and involvement, family and community lifestyles, child abuse, and current family life issues. Students will develop activities to enhance understanding of diverse lifestyles and multi-cultural influences. Field projects in the community are required. (Semester)

**Teacher Cadet Program.** The goal of the Teacher Cadet is to encourage academically able students who possess exemplary interpersonal and leadership skills to consider teaching as a career. An important secondary goal is to provide these talented future community leaders with insights about teachers and schools so that they will be civic advocates of education. The Oklahoma program consists of three units for a full-year credit:

- 1) "The Learner" lays the foundation for later experiences in the course, providing an overview of child development, exposure to learning styles and opportunities for students to observe learners in nurseries, daycare centers, elementary, secondary and special classrooms.

2) “The School” consists of several readings and class discussions related to the history and development of education in (State), the tenets of effective schools and current issues in education.

3) “The Teacher and Teaching” introduces students to lesson planning and contains the most critical part of the course, an intensive multi-week internship under the watchful eye of a master classroom teacher. Most internship experiences take place at the elementary level, but could be adapted to middle or secondary level.

## 2. Early Childhood Development (Tech Prep Program is Child Development)

### Support and Career Exploratory (See *Appendix 3.*)

**Introduction to Early Childhood Education.** An introduction to the profession of early childhood education, focusing on developmentally appropriate practices, types of programs, historical perspectives, ethics, and current issues. One hour per week of supervised fieldwork with young children is required. (Semester)

**The Infant and Toddler.** A study of appropriate infant and toddler (birth to 3 years) child care programs. Topics covered include an overview of development; quality caregiving routines; appropriate environments; and age-appropriate teaching techniques. Regularly scheduled observations of young children are required. (Semester)

**Children with Special Needs.** A survey of information regarding children with special needs including possible causes and characteristics of exceptionalities, intervention strategies, available resources, referral processes, the advocacy role and legislative issues. Regularly scheduled observations of children are required. (Semester)

**Child Growth and Development.** A study of the principles of child growth and development from conception to adolescence. Topics covered include physical, social-emotional and cognitive domains; influences on development and methods of child observation. (Semester)

**Special Topics in Family Life and Relations Studies.** A study of the methods of parenting that encourage positive attitudes in children. Explores the adult/child relationship, including realistic principles that provide adults with the skills and understanding to confidently rear and teach children. Topics include choosing parenthood, the early years, discipline, illness and death and societal support. Integration of these principles will be applied to a variety of settings through field projects. (Semester)

**Curriculum Resources for Early Childhood Programs.** A study of the fundamentals of curriculum design and implementation in developmentally appropriate programs for children. Topics covered include developmentally appropriate practices; curricula models; and anti-bias curricula. Requires 3 hours per week of supervised fieldwork with young children. (Semester)

**Family and Community.** A study of the relationship between the child, the family, the community, and educators, including parent education and involvement, family and community lifestyles, child abuse, and current family life issues. Students will develop activities to enhance understanding of diverse lifestyles and multi-cultural influences. Field projects in the community are required. (Semester)

3. **Concentration in Humanities** (Four or more credits drawn from foreign language, fine arts, journalism, debate or advanced-level courses in literature, history, economics psychology or another humanities area) If a student has a career interest in teaching a humanities-related subject in middle or secondary grades, a concentration in humanities provides a strong foundation. The emphasis would be in whichever subject is of interest.

Support and Career Exploratory (See *Appendix 3.*)

4. **Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science with at least one AP credit in science.) If a student has a career interest in teaching mathematics or science in middle or secondary grades, a concentration in mathematics and science provides a strong foundation. The emphasis would be in whichever subject is of interest.

Support and Career Exploratory (See *Appendix 3.*)

### **Degree Opportunities at Austin Community College**

General Studies Early Childhood Education (A.A.)  
Child Development (A.A.S.)

### **Certifications**

Child Development Certificate  
Academic CDA Training Program Institutional Certificate  
Professional Recognition for Caregivers Institutional Certificate  
General Studies in Grade 4-8 Certifications (A.A.)  
Child Development Associate (Council for Professional Recognition)  
Educational Aide I and Educational Aide II (State of Texas)  
(see *Appendix 8 for additional certifications, competency assessments and licensures.*)

## Cluster 5: Medical Science and Health Services

**Description:** Planning, managing, and providing diagnostic, therapeutic, and information and environmental services in health care

Top 25	Medical Science and Health Services – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Registered Nurses	6,175	99
2	Nursing Aides, Orderlies, & Attendants	3,075	49
3	Personal & Home Care Aides	3,015	48
4	Licensed Practical & Licensed Vocational Nurses	2,590	41
5	Home Health Aides	2,435	39
6	Medical Assistants	1,565	25
7	Medical & Health Services Managers	905	14
8	Pharmacy Technicians	900	14
9	Medical Records & Health Information Technicians	870	14
10	Pharmacists	870	14
11	Dental Assistants	850	14
12	Radiologic Technologists & Technicians	620	10
13	Emergency Medical Technicians & Paramedics	525	8
14	Medical & Clinical Laboratory Technicians	465	7
15	Medical Secretaries	450	7
16	Speech-Language Pathologists	435	7
17	Fitness Trainers & Aerobics Instructors	430	7
18	Respiratory Therapists	415	7
19	Physical Therapists	410	7
20	Medical & Clinical Laboratory Technologists	410	7
21	Surgical Technologists	340	5
22	Physicians & Surgeons,	335	5
23	Healthcare Support Workers,	330	5
24	Medical Transcriptionists	295	5
25	Dental Hygienists	270	4
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>28,980</b>	<b>462</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Medical Science & Health Services (Fall 2003-2004)

<b>District Total</b>	230	(only Akins, Crockett and Lanier have health programs)
Akins	62	
Crockett	78	
Lanier	90	

## Areas of Concentration

### 1. General Medicine

**Support and Career Exploratory** (See *Appendix 3*.)

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Medical Law/Ethics For Health Professionals.** Introduction to the relationship between legal aspects and ethics associated with the health care field. Emphasis on ethical and legal responsibilities of health care professionals. (Semester)

**Cellular and Molecular Biology.** General Biology course designed for science majors and students with a strong science background who desire an in-depth approach to biological topics. An introduction to the physical and chemical organization of living organisms; cell structure, function, and metabolism; classical and molecular genetics; gene regulation; genetic engineering; molecular aspects of development; and reproduction. (Semester)

**Structure and Function of Organisms.** General Biology course designed for science majors and students with a strong science background who desire an in-depth approach to biological topics. An introduction to the diversity, anatomy, physiology, reproduction, development, behavior, and evolution of living organisms. Includes viruses, prokaryotes, protists, fungi, plants, and animals. (Semester)

**Human Anatomy.** A detailed study of the structures of the human body with emphasis on gross and histological study of the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems (Semester)

**Human Physiology.** A detailed study of the physiological processes of the human body. (Semester)

### 2. Pre-nursing

**Support and Career Exploratory** (See *Appendix 3*.)

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Medical Law/Ethics for Health Professionals.** Introduction to the relationship between legal aspects and ethics associated with the health care field. Emphasis on ethical and legal responsibilities of health care professionals. (Semester)

**Foundations of Nursing Practice.** Introduction to the role of the professional nurse as a provider of care, coordinator of care, and member of profession. Topics include but are not limited to the fundamental concepts of nursing practice, history of professional nursing, a systematic framework for decision-making, mechanisms of disease, the needs and problems that nurses help patients manage, and basic psychomotor skills. Emphasis on knowledge, judgment, skills, and professional values within a legal/ethical framework. (Semester)

**Nursing Skills.** Study of the concepts and principles essential for demonstrating competence in the performance of nursing procedures. Topics include knowledge, judgment, skills, and professional values within a legal/ethical framework. Job shadowing for a total of 15 hours (Semester)

**Introduction to Community-Based Nursing.** Overview of the delivery of nursing care in a variety of community-based settings; application of systematic problem-solving processes and critical thinking skills, focusing on the examination of concepts and theories relevant to community-based nursing; and development of judgment, skill, and professional values within a legal/ethical framework. (Semester)  
**OR Common Concepts in Adult Health.** Study of the general principles of caring for selected adult clients and families in structured settings with common medical-surgical health care needs related to each body system. Emphasis on knowledge judgment, skills, and professional values within a legal/ethical framework. (Semester)

### **3. Medical Services and Technology (Emphasis in Medical Records, Pharmacy, Laboratory or Radiology)**

**Support and Career Exploratory** (See *Appendix 3.*)

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Legal and Ethical Aspects of Health Information.** Concepts of confidentiality, ethics, health care legislation, and regulations relating to the maintenance and use of health information. Suitable for all health care majors. (Semester)

**Anatomy and Physiology for Medical Assistants.** Emphasis on normal human anatomy and physiology of cells, tissues, organs, and systems with overview of common pathophysiology. (Semester)

#### **MEDICAL RECORDS Emphasis:**

**Health Data Content and Structure.** Introduction to systems and processes for collecting, maintaining, and disseminating primary and secondary health related information. Instruction in delivery and organizational structure to include content of health record, documentation requirements, registries, indices, licensing, regulatory agencies, forms, and screens. (Semester)

**Coding and Classification Systems.** Application of basic coding rules, principles, guidelines, and conventions. (Semester)

#### **MEDICAL LABORATORY TECHNICIAN Emphasis**

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Introduction to Clinical Laboratory Science.** An introduction to clinical laboratory science, including quality control, laboratory math, safety, basic laboratory equipment, laboratory settings, accreditation and certification. (Semester)

**Introduction to Chemistry.** An introduction to the basic concepts of chemistry. Includes the metric system, atomic structure, the periodic table, ionic and covalent bonding, nomenclature of chemical elements and compounds, balancing chemical reactions, oxidation/reduction, states of matter, and solution concentrations. Some fundamental mathematical concepts crucial to chemistry are also covered. (Semester)

**Clinical Chemistry.** An introduction to the principles and procedures of various tests performed in Clinical Chemistry. Presents the physiological basis for the test, the principle and procedure for the test, and the clinical significance of the test results, including quality control and normal values. Also includes basic chemical laboratory technique, chemical laboratory safety, electrolytes and acid-base balance, proteins, carbohydrates, lipids, enzymes, metabolites, endocrine function, and toxicology. (Semester)

### **PHARMACY Emphasis**

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Introduction to Pharmacy.** Examination of the qualifications, operational guidelines, and job duties of a pharmacy technician. Topics include definitions of a pharmacy environment, the profile of a pharmacy technician, legal and ethical guidelines, job skills and duties, verbal and written communication skills, professional resources, safety techniques, and supply and inventory techniques. (Semester)

**Pharmaceutical Mathematics.** Pharmaceutical mathematics including reading, interpreting, and solving calculation problems encountered in the preparation and distribution of drugs. Conversion of measurements within the apothecary, avoirdupois, and metric systems with emphasis on the metric system of weight and volume. Topics include ratio and proportion, percentage, dilution and concentration, milliequivalent, units, intravenous flow rates, and solving dosage problems. (Semester)

**Institutional Pharmacy Practice.** Exploration of the unique role and practice of pharmacy technicians in an institutional pharmacy with emphasis on daily pharmacy operation. Topics include hospital pharmacy organization, work flow and personnel, medical and pharmaceutical terminology, safety techniques, data entry, packaging and labeling operations, extemporaneous compounding, inpatient drug distribution systems, unit dose cart fills, quality assurance, drug storage, and inventory control. (Semester)

### **RADIOLOGY Emphasis**

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Anatomy and Physiology I.** Introduction to the structure and function of the human body with an emphasis on anatomy. (Semester)

**Principles of Radiographic Imaging I.** This course will analyze radiographic image qualities and the effects of exposure variables upon these qualities. (Semester)

**Introduction to Radiography and Patient Care.** This course includes the historical development of radiography, basic radiation protection, an introduction to medical terminology, ethical and legal issues for health care professionals, and an orientation to the program and to the health care system. Patient assessment, infection control procedures, emergency and safety procedures, communication and patient interaction skills, and basic pharmacology are also included. (Semester)

**Radiographic Anatomy and Physiology I.** This course develops the students' ability to relate basic human anatomy and physiology to the image. The localization and identification of human anatomy on the radiographic image is emphasized. (Semester)

#### 4. Emergency Services

**Support and Career Exploratory** (See *Appendix 3*.)

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Anatomy and Physiology I.** Introduction to the structure and function of the human body with an emphasis on anatomy. (Semester)

**EMT -- Basic.** Introduction to the level of Emergency Medical Technician (EMT)--Basic. Includes all the skills necessary to provide emergency medical care at a basic life support level with an ambulance service or other specialized services. (Semester)

**EMT -- Basic Clinical.** A method of instruction providing detailed education, training and work-based experience, and direct patient/client care, generally at a clinical site. (Semester)

**Introduction to Advanced Practice.** An exploration of the foundations necessary for mastery of the advanced topics of clinical practice out of the hospital. (Semester)

**Pharmacology for Health Professions.** A study of drug classifications, actions, therapeutic uses, adverse effects, methods of administration, client education, and calculation of dosages. (Semester)

#### 5. Sports Medicine/Personal Trainer

**Support and Career Exploratory** (See *Appendix 3*.)

**Medical Terminology.** A study of word origin and structure through the introduction of prefixes, suffixes, root words, plurals, abbreviations and symbols, surgical procedures, medical specialties, and diagnostic procedures. (Semester)

**Anatomy and Physiology I.** Introduction to the structure and function of the human body with an emphasis on anatomy. (Semester)

**Anatomy and Physiology II.** Study of the structure and function of the human body with an emphasis on physiology. (Semester)

**Exercise Science.** A survey of scientific principles, methodologies, and research as applied to exercise and physical fitness. Emphasis on physiological responses and adaptations to exercise. Topics include basic elements of kinesiology, biomechanics, motor learning, and the physical fitness industry. (Semester)

**Performance Enhancement for Athletics.** A study of the scientific principles and methodologies to enhance athletic performance. Emphasis on the concepts of periodization of training as it relates to preseason, competitive season, and off-season goals. Topics include evaluation and assessment protocols, exercise techniques, and safety. (Semester) **OR Fitness and Exercise Testing.** A study of the techniques for conducting physical fitness assessments including tests of cardiorespiratory fitness, muscular strength and endurance, joint flexibility, body composition, and pulmonary capacity. Topics include an introduction to electrocardiography and equipment use and maintenance. Emphasis on safety guidelines and precautions. (Semester)

**6. Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science with at and emphasis in biology and chemistry and least one AP credit in science.) If a student has an interest in any health-related career, a concentration in mathematics and science provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement science courses with an emphasis in life sciences.

**Support and Career Exploratory** (See *Appendix 3.*)

### **Degree Opportunities at Austin Community College**

Biology (A.A.)  
Biotechnology (A.A.S.)  
Dental Hygiene (A.A.S.)  
Emergency Medical Services Professions (A.A.S.)  
Health and Kinesiology (A.A.S.)  
Medical Coding (A.A.S.)  
Medical Laboratory Technology (A.A.S.)  
Nursing (Professional) (A.A.S.)  
Nursing (Vocational) (A.A.S.)  
Occupational Therapy (A.A.S.)  
Personal Fitness Trainer (A.A.S.)  
Pharmacy Technician (A.A.S.)  
Physical Therapist Assistant (A.A.S.)  
Pre-Dental (A.S.)  
Pre-Medical (A.S.)  
Pre-Pharmacy (A.S.)  
Radiology (A.A.S.)  
Sonography (A.A.S.)  
Surgical Technology (A.A.S.)

## Certifications

EMT Intermediate Certificate

EMT Paramedic Certificate

Medical Coding Specialist Certificate

Nursing Vocational Certificate

Personal Fitness Trainer Certificate

Pharmacy Technician Certificate

*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 6: Hospitality and Tourism

**Description:** Planning, managing and providing lodging, food, recreation, convention and tourism, and related planning and support services such as travel-related services.

Top 25	Hospitality and Tourism – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Combined Food Preparation & Serving Workers, Including Fast Food	14,715	235
2	Waiters & Waitresses	10,790	173
3	Janitors & Cleaners, Ex Maids & Housekeeping Cleaners	5,025	80
4	Maids & Housekeeping Cleaners	3,705	59
5	Food Preparation Workers	3,595	58
6	Counter Attendants, Cafeteria, Food Concession, & Coffee Shop	2,630	42
7	Cooks, Restaurant	2,355	38
8	Food Servers, Non-restaurant	1,415	23
9	Cooks, Institution & Cafeteria	1,405	22
10	First-Line Supervisors/Managers of Food Prep. & Serving Workers	1,375	22
11	Cooks, Fast Food	1,250	20
12	Dishwashers	1,205	19
13	Food Service Managers	1,110	18
14	Dining Room & Cafeteria Attendants & Bartender Helpers	1,060	17
15	Hosts & Hostesses, Restaurant, Lounge, & Coffee Shop	1,035	17
16	Bartenders	980	16
17	Reservation & Transportation Ticket Agents & Travel Clerks	960	15
18	Hotel, Motel, & Resort Desk Clerks	865	14
19	First-Line Supervisors/Managers of Housekeeping & Janitorial Workers	630	10
20	Chefs & Head Cooks	530	8
21	Cooks, Short Order	485	8
22	Food Preparation and Serving Related Workers,	315	5
23	Travel Agents	290	5
24	Bakers	250	4
25	Meeting & Convention Planners	115	2
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>58,090</b>	<b>930</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Hospitality and Tourism” (Fall 2003-2004)

<b>District Total</b>	192	Johnston	40
Akins	2	Lanier	6
Anderson	2	LBJ	1
Austin	3	McCallum	4
Bowie	59	Reagan	2
Crockett	6	Travis	67

## Areas of Concentration

### 1. Hospitality Management (Aligned to ACC, but could use NAF Academy of Travel & Tourism described in Appendix 5.)

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Hospitality Industry.** An introduction to lodging and food service operations. Topics include growth, development, and organization of the lodging industry; growth, development, organization, structure, and management of food service operations; human resources, marketing, security, engineering, and maintenance of hospitality operations; and opportunities within the travel and tourism industry. (Semester)

**Computers in Hospitality.** An introduction to computers and their relationship as an information system to the hospitality industry. The course includes an overview of industry-specific software. (Semester)

**Hospitality Human Resources Management.** A study of the principles and procedures of managing people in the hospitality industry. (Semester)

**Travel Automation.** An introduction to computer training using one of the major computer reservation systems for the travel industry. (Semester)

**Travel and Tourism Sales and Marketing Techniques.** A study of marketing, sales techniques, promotions and advertising theories as applied to the travel and tourism industry. Coverage of the marketing mix in travel, market segmentation, market planning, and the use of advertising and other communication techniques. Emphasis on buyer motivation, telephone sales techniques, profitable travel counseling, and the use of promotional material in selling travel. (Semester)

**Group Tour Operations.** A study of the role of the group planner, selling to groups, and planning itineraries. Including components of a tour package, tour costing, advertising and promotion, group dynamics, and tour guide qualifications. (Semester)

#### **Alternative Alignment – National Academy Foundation’s Academy of Hospitality & Tourism**

*The Academy of Hospitality & Tourism (AOHT) provides public high school students with the requisite knowledge and skills for a successful career in one of the world's largest service industries, through a curriculum that includes coursework in business, geography, hospitality, and economics. The Academy of Hospitality & Tourism curriculum has been developed with leading representatives from industry and education. By integrating necessary workplace skills in the classroom, students come to understand the connection between academic learning and career success. To ensure that courses are both current and relevant, NAF has been working with its industry and academic partners to update and revise the AOHT curriculum. This process will yield new courses and sequences to be taught beginning in fall of 2005. It is anticipated that new courses will be developed in the following areas: Hospitality and Lodging, Travel and Transportation Systems, Travel Destinations, Sports/Entertainment/Special Events, and Business for Hospitality and Tourism.*

**Business Computer Applications.** (one term recommended) A school-designed course preferably offered in the freshman or sophomore year. Taught by a computer science, mathematics or business teacher.

**Introduction to Hospitality & Tourism** (one term required) This is a one-term course that provides an introduction to various components of the hospitality and tourism industry. Students are given an overview of the various components of the industry, an introduction to business and marketing, opportunities to learn and practice customer service principles, and exposure to the various careers available in hospitality and tourism.

**Geography for Hospitality & Tourism** (one term required) This is a one-term course geared at having students develop broad geographic skills. In addition to learning how to use the basic tools of the geographer, students learn how economics, culture, history and political issues all affect the study of geography, and how geography affects these other disciplines.

**Hospitality and Tourism Systems** (one term required) This one-semester course provides an overview of the systems and technology that provide infrastructure for the industry, including reservations, transportation and online systems. Upon completion of this course, students will be able to apply these technology principles in other courses, such as Hospitality, Business, and Sports, Entertainment, and Event Management.

**Economics for Hospitality & Tourism** (One term required) This is a basic principles and practices one-semester course that parallels the concepts taught in standard high school-required Economics courses. Academy students take this course in lieu of the Economics course offered at their school. Throughout the course, examples of economic principles are drawn from the world of hospitality and tourism in order to integrate academic learning and practical business applications.

**Business for Hospitality & Tourism** This course is best delivered as a one- or two-semester capstone to the Academy program. In the course, students learn and apply business, marketing, entrepreneurship and finance principles within a student-centered, project-oriented approach.

**Sports, Entertainment, and Event Management** This course is optional for Academies that want to give their students exposure to such areas as event planning and facility and event management. In this course, students will be given the authentic opportunity to plan their own events.

**Foreign Language** (at least two years highly recommended)

**Paid Internship.**

- 2. Culinary Arts** (Aligned with ACC, but could consider Texas Culinary Academy described in Appendix 5) In addition, AISD has several courses in Culinary Arts and Hospitality Services that could yield Tech Prep credit.

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Foods.** A study of the composition of food and the chemical and biological changes that occur in storage and processing. Includes preparation techniques and selection principles. (Semester)

**Introduction to Hospitality Industry.** An introduction to lodging and food service operations. Topics include growth, development, and organization of the lodging industry; growth, development, organization, structure, and management of food service operations; human resources, marketing, security, engineering, and maintenance of hospitality operations; and opportunities within the travel and tourism industry. (Semester)

**Sanitation and Safety.** Introduction to sanitation and public health as related to the food service industry, including potential hazards that may occur in the operation and production of food. (Semester)

**Basic Food Preparation.** A study of the fundamental principles of food preparation and cookery to include Brigade System, cooking techniques, material handling, heat transfer, sanitation, safety, nutrition, and professionalism. (Semester)

**Food Production and Planning.** Skill development in basic mathematical operations and study of their applications in the food service industry. Topics include percentages, weights and measures, ratio and proportion, weights and measures conversions, determination of portion costs for menu items and complete menus, portion control, and the increase and decrease of standard recipes. (Semester)

**Dining Room Service.** Introduces the principles, concepts, and systems of professional table service. Topics include dining room organization, scheduling, and management of food service personnel. (Semester)

**3. Concentration in Humanities** (Four or more credits drawn from foreign language, fine arts, journalism, debate or advanced-level courses in literature, history, economics psychology or another humanities area) If a student has a career interest in hospitality management, a concentration in humanities provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement courses in economics, marketing, languages, communications and culture.

**Support and Career Exploratory** (See *Appendix 3.*)

### **Degree Opportunities at Austin Community College**

Culinary Arts (A.A.S.)  
Hospitality Management (A.A.S.)  
Meeting & Events Planning (A.A.S.)  
Travel & Tourism (A.A.S.)

### **Certifications**

Culinary Arts, Basic Certificate (ACC)  
Culinarian, Certificate (ACC)  
Travel and Tourism Certificate (ACC)  
(see *Appendix 8 for additional certifications, competency assessments and licensures.*)

## Cluster 7: Human Services

**Description:** Planning, managing, and providing human services including social and related community services.

Top 25	Human Services – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Child Care Workers	7,275	116
2	Clergy	1,830	29
3	Fire Fighters	780	12
4	Hairdressers, Hairstylists, & Cosmetologists	760	12
5	Counselors, Social, & Religious Workers,	690	11
6	Social & Human Service Assistants	620	10
7	Laundry & Dry-Cleaning Workers	540	9
8	Dispatchers, Ex Police, Fire, & Ambulance	515	8
9	Employment, Recruitment, & Placement Specialists	500	8
10	Child, Family, & School Social Workers	450	7
11	Refuse & Recyclable Material Collectors	375	6
12	Compliance Officers, Ex Agriculture, Construction, Health & Safety, & Transportation	355	6
13	Personal Care and Service Workers,	320	5
14	Social & Community Service Managers	305	5
15	Directors, Religious Activities & Education	300	5
16	Clinical, Counseling, & School Psychologists	295	5
17	Occupational Therapists	260	4
18	Police, Fire, & Ambulance Dispatchers	250	4
19	First-Line Supervisors/Managers of Personal Service Workers	200	3
20	First-Line Supervisors/Managers Fire Fighting & Prevention Workers	185	3
21	Mental Health & Substance Abuse Social Workers	180	3
22	Funeral Attendants	160	3
23	Substance Abuse & Behavioral Disorder Counselors	130	2
24	Social Scientists and Related Workers,	115	2
25	Rehabilitation Counselors	110	2
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>17,500</b>	<b>280</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Human Services” (Fall 2003-2004)

<b>District Total</b>	797	Johnston	67
Akins	138	Lanier	2
Anderson	164	McCallum	106
Austin	75	Reagan	79
Bowie	102	Travis	22
Crockett	42		

## Areas of Concentration

### 1. Early Childhood Development & Services (Similar to Education and Training)

**Support and Career Exploratory** (See *Appendix 3*.)

**Family and Community.** A study of the relationship between the child, the family, the community, and educators, including parent education and involvement, family and community lifestyles, child abuse, and current family life issues. Students will develop activities to enhance understanding of diverse lifestyles and multi-cultural influences. Field projects in the community are required. (Semester)

**Child Growth and Development.** A study of the principles of child growth and development from conception to adolescence. Topics covered include physical, social-emotional and cognitive domains; influences on development and methods of child observation. (Semester)

**Children with Special Needs.** A survey of information regarding children with special needs including possible causes and characteristics of exceptionalities, intervention strategies, available resources, referral processes, the advocacy role and legislative issues. Regularly scheduled observations of children are required. (Semester)

**Introduction to Early Childhood Education.** An introduction to the profession of early childhood education, focusing on developmentally appropriate practices, types of programs, historical perspectives, ethics, and current issues. (Semester)

**Nutrition, Health, and Safety.** A study of nutrition, health, safety, and related activities, including skill development in management of issues, guidelines, and practices in nutrition, as well as community health, hygiene, safety, and legal implications. Integration of these principles will be applied to a variety of settings through field projects. (Semester)

### 2. Family & Community Services

**Support and Career Exploratory** (See *Appendix 3*.)

**Dynamics of Human Relations.** Discussion of the dynamics necessary for developing and maintaining positive/productive interpersonal and work relationships. Exploration will include open communication, assertiveness, self-disclosure, and building relationships with group members in a way that enhances trust and mutual concern. Knowledge gained in class is designed to transfer to actual working situations. (Semester)

**Orientation to Social Services.** Introduction to the basic concepts, information, and practices within the field of social services. Topics include a survey of the historical development of social services; social, legal, and clinical definitions; and review of current information regarding indications for and methods of treatment and/or services. (Semester)

**Introduction to Psychology.** Survey of introductory topics such as learning, memory, sensation and perception, personality, life-span development, physiological basis of behavior, stress and health, psychological disorders, social psychology, and research methods. (Semester)

**Counseling Theories.** An examination of major theories of various treatment modalities. Topics include reality therapy, psychodynamics, grief therapy, person-centered therapy, rational emotive

therapy, and cognitive behavioral approaches. Attention is given to the role of counselor as part of the total spectrum of human services. (Semester)

**Introduction to Alcohol and Other Addictions.** Causes and consequences of addiction as they relate to the individual, family, community, and society are discussed. Response alternatives regarding intervention, treatment, education, and prevention are reviewed. Competencies and requirements for licensure in Texas are explained. (Semester)

**Principles of Behavior Management and Modification.** A study of the theories and principles of behavior management, cognitive theories and techniques. Emphasis will be on their applications including managing self-behavior. In-depth study will be in operant conditioning techniques, to the social environment. Emphasis on critical areas of the adolescent period of the life cycle. Fieldwork desirable. (Semester)

### 3. Fire Protection

**Support and Career Exploratory** (See *Appendix 3.*)

**Fundamentals of Fire Protection.** Study of the philosophy, history and fundamentals of public and private fire protection. Topics include statistics of fire and property loss, agencies involved in public and private protection, legislative development, departmental organization, training and staffing. (Semester)

**Fire and Arson Investigation I.** In-depth study of basic fire and arson investigation practices. Emphasis on fire behavior principles related to fire cause and origin determination. Fieldwork desirable. (Semester)

**Fire Prevention Codes and Inspections.** Study of local building and fire prevention codes. Emphasis on fire prevention inspections, practices, and procedures. Fieldwork desirable. (Semester)

**Hazardous Materials I.** This is a basic course designed for first responders (police, fire, medical) to hazardous materials incidents. The course materials include an introduction to Haz-Mat, identifying hazardous materials, community risk assessment, command and control of incidents, and operations at incidents. Federal, state, and local regulations that apply to hazardous material will also be studied. Recognition of shipping containers and knowledge of labels, placards, and other marking systems will be learned. (Semester)

### 4. Personal Services – Cosmetology, Hairstyling and Barbering (No alignment with ACC)

Programs at Crockett, Johnston and Lanier

**5. Concentration in Humanities** (Four or more credits drawn from foreign language, fine arts, journalism, debate or advanced-level courses in literature, history, economics psychology or another humanities area) If a student has a career interest in human services, a concentration in humanities provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement courses in economics, psychology, sociology, government, communications and culture. For child development, students might take dual credit courses in children's literature class or recreational or art activities for children.

**Support and Career Exploratory** (See *Appendix 3.*)

## **Degree Opportunities at Austin Community College**

Addictions Counseling (A.A.S.)  
Child Development (A.A.S.)  
Fire Protection (A.A.S.)  
General Human Services (A.A.S.)  
General Studies in Early Childhood Education (A.A.)  
Human Services (A.A.S.)  
Interpreter Preparation Program (A.A.S.)  
Psychology (A.A.)  
Social Work (A.A.)  
Sociology (A.A.)  
Speech (A.A.)  
Therapeutic Recreation (A.A.S.)

## **Certifications**

Addictions Counseling Certificate (ACC)  
American Sign Language Studies Certificate (ACC)  
Child Development Certificate (ACC)  
Interpreter Preparation Program Certificate (ACC)  
Texas Fire Commission, Firefighter Certificate  
Therapeutic Recreation Certificate (ACC)

*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 8: Information Technology

**Description:** Designing, developing, managing and operating communication and information technology systems, networks and related hardware and software for telecommunications and computing services.

ALL IT	Information Technology – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Computer Support Specialists	3,515	56
2	Computer Software Engineers, Applications	2,535	41
3	Computer Systems Analysts	2,045	33
4	Computer Software Engineers, Systems Software	1,985	32
5	Network & Computer Systems Administrators	1,440	23
6	Computer & Information Systems Managers	1,380	22
7	Computer Programmers	1,255	20
8	Computer Specialists,	810	13
9	Network Systems & Data Communications Analysts	615	10
10	Telecommunications Line Installers & Repairers	495	8
11	Semiconductor Processors	435	7
12	Telecommunications Equipment Installers & Repairers, Ex Line Installers	435	7
13	Database Administrators	410	7
14	Computer Hardware Engineers	365	6
15	Computer Operators	215	3
16	Computer, Automated Teller, & Office Machine Repairers	210	3
17	Computer Science Teachers, Postsecondary	100	2
18	Computer & Information Scientists, Research	95	2
<b>TOTAL ANNUAL DEMAND</b>		<b>18,340</b>	<b>295</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE Enrollment “Information Technology” (Fall 2003-2004)

<b>District Total</b>	257	LBJ	15
Akins	25	Lanier	82
Anderson	23	Reagan	1
Crockett	80	Travis	31

## Areas of Concentration

### 1. Network Systems

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Computing.** A survey course discussing computing terminology, components, programming concepts, and the computer's integration into business activities. Laboratory experience includes word processing, spreadsheets, presentation software and databases. (Semester)

**Fundamentals of Programming.** An introduction to computer concepts, logic, and computer programming. Includes designing, coding, debugging, testing, and documenting programs using a high-level programming language. (Semester)

**Fundamentals of Networking.** Instruction in networking technologies and their implementation. Topics include the OSI reference model, network protocols, transmission media, and networking hardware and software (Semester)

**Introduction to Visual Basic Programming .Net.** Introduction to computer programming using Visual BASIC. Emphasis on the fundamentals of structured design, development, testing, implementation, and documentation. Includes language syntax, data and file structures, input/output devices, and files. (Semester)

**Implementing Microsoft Windows Network Infrastructure.** Installing, configuring, managing, and supporting a network infrastructure that uses the Microsoft Windows 2000 server family of products. (Semester)

### 2. Information Support and Services

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Computing.** A survey course discussing computing terminology, components, programming concepts, and the computer's integration into business activities. Laboratory experience includes word processing, spreadsheets, presentation software and databases. (Semester)

**Fundamentals of Programming.** An introduction to computer concepts, logic, and computer programming. Includes designing, coding, debugging, testing, and documenting programs using a high-level programming language. (Semester)

**Introduction to Database.** Introduction to database theory and the practical applications of a database. (Semester)

**Implementing and Supporting Client Operating Systems.** Skills development in the management of client as desktop operating systems. Provide students with a comprehensive overview of the features and functions of Microsoft Windows XP Professional in the Small Office/Home Office environment. This includes a look at the configuration, management and networking functionality of Windows XP as a SOHO web server. (Semester)

**Information Technology Security.** Instruction in security for network hardware, software, and data including physical security, backup procedures, relevant tools; encryption; and protection from viruses. (Semester)

### 3. Computer Programming and Software Development

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Computing.** A survey course discussing computing terminology, components, programming concepts, and the computer's integration into business activities. Laboratory experience includes word processing, spreadsheets, presentation software and databases. (Semester)

**Fundamentals of Programming.** An introduction to computer concepts, logic, and computer programming. Includes designing, coding, debugging, testing, and documenting programs using a high-level programming language. (Semester)

**Fundamentals of Networking Technologies.** Instruction in networking technologies and their implementation. Topics include the OSI reference model, network protocols, transmission media, and networking hardware and software. (Semester)

**Database Programming: Oracle.** Application development using database programming techniques emphasizing database structures, modeling, and database access. This course instructs the student in the essential concepts and design methodology for the Relational Database Model as implemented by Oracle. Other topics include: the Data definition Language, the Data Manipulation Language, database normalization, transaction processing, security, multi-user problems and solutions. (Semester)

**Introduction to Oracle Sql And Pl/Sql.** An introduction to the design and creation of relational databases. Topics include storing, retrieving, updating, and displaying data using Structured Query Language (SQL) and Procedure Language (PL). (Semester)

#### **Option to Adopt National Academy Foundation's Academy of Information Technology.**

*The Academy of Information Technology (AOIT) introduces students to the broad career opportunities in today's digital workforce and equips them with the personal, analytical, technical and communication skills they need. AOIT opens the door to new options, so that students may make sound choices for the future.*

**Strategies for Success with Computer Applications.** A full year course, Strategies for Success should be offered in the ninth or tenth grades as it helps students to develop good work and study habits, learn about school resources, prepare portfolios, develop career plans, begin preparation for college and develop solid interpersonal skills. The computer applications segment of the course covers presentations, word processing, spreadsheets, e-mail, browsers, and desktop publishing.

**Introduction to Information Technology.** In this course, students are presented with the basic concepts of Information Technology, including various career paths as well as the impact of Information Technology on the world, people and industry.

**Introduction to Internet.** This course presents the basics of Web page design, focusing on learning about and writing in HTML and increasing Web page performance. Additional topics include determining appropriate image formats and working with plug-ins.

**Logic for Programming.** The main objective of this course is for students to learn fundamental programming skills useful with most computer languages. Students will describe, analyze and solve programming problems within the syntax of the Scheme programming language.

**Digital Networks.** In this course, students address the basic concepts of connecting multiple computing devices physically as well as logically. Topic areas include bandwidth, access time, data rate, and error detection and correction. Additional topics may be added, as appropriate.

**Systems Support and Maintenance.** This course introduces students to the inner workings of computer systems, including how to troubleshoot and repair various hardware, software and configuration problems. Additional concentrations include how to install basic computer components and how to install and configure software ranging from operating systems to applications.

**Digital Media.** Students in this course gain an increased understanding of digital media, including audio, video, graphics, text, and animation tools. Concepts such as color and presentation are also addressed.

**Java or C++.** This course carries students into advanced programming concepts such as object-oriented programming and complex data structures. Additionally, students focus on the concept of code reuse by working on previously created code that has been incorrectly documented.

**Advanced Web Tools.** Students are introduced to advanced Web topics in this course, such as Java, Web-scripting, Web server administration and the various multimedia tools and concepts available.

**Databases.** In this course students are introduced to the basic concepts of relational database engines and their respective tools. Database concepts of tables, rows, indexes, constraints, triggers, SQL syntax, storage and data relationships are among the concepts presented

4. **Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science with at least one AP credit in science.) If a student has an interest in any information technology-related career, a concentration in mathematics and science provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement mathematics and physics courses.

**Support and Career Exploratory** (See *Appendix 3.*)

#### **Degree Opportunities at Austin Community College**

Computer Information Technology (A.A.S.)

Computer Science (A.A.)

Electronics (A.A.)

#### **Certifications**

Local Area Network Systems Network Administrator

Computer Information Technology Database

Computer Programming Java Track

Computer Programming C++ Track

Web Developer Specialist

(see *Appendix 8* for additional certifications, competency assessments and licensures.)

## Cluster 9: Legal and Protective Services

**Descriptions:**

**Legal & Protective Services:** Planning, managing and providing judicial, legal, and protective services including professional and technical support services in the fire protection and criminal justice systems.

**Public Administration & Government Services:** Planning, managing and providing government legislative and administrative and regulatory services and related general purpose government services at the federal, state, and local levels.

Top 25	Legal & Protective Services – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Security Guards	4,440	71
2	Correctional Officers & Jailers	2,705	43
3	Police & Sheriff's Patrol Officers	2,605	42
4	Postal Service Mail Carriers	840	13
5	Protective Service Workers,	810	13
6	Lawyers	665	11
7	Legal Secretaries	510	8
8	Detectives & Criminal Investigators	405	6
9	Paralegals & Legal Assistants	330	5
10	First-Line Supervisors/Managers of Police & Detectives	320	5
11	Legal & Related Workers,	295	5
12	First-Line Supervisors/Managers, Protective Service Workers,	235	4
13	First-Line Supervisors/Managers of Correctional Officers	210	3
14	Probation Officers & Correctional Treatment Specialists	165	3
15	Court, Municipal, & License Clerks	145	2
16	Private Detectives & Investigators	120	2
17	Legislators	115	2
18	Judges, Magistrate Judges, & Magistrates	65	1
19	Urban and Regional Planners	50	1
20	Court Reporters	35	1
21	Law Clerks	35	1
22	Criminal Justice & Law Enforcement Teachers, Postsecondary	30	0
23	Law Teachers, Postsecondary	30	0
24	Postmasters and Mail Superintendents	30	0
25	Legal Support Workers,	25	0
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>15,215</b>	<b>242</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

## AISD CATE Enrollment “Legal and Protective Services” (Fall 2003-2004)

District Total 149      Lanier 149

### Areas of Concentration

#### 1. Law and Criminal Justice (Corrections/Law Enforcement Emphasis)

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Criminal Justice.** History and philosophy of criminal justice and ethical considerations; crime defined: its nature and impact; overview of criminal justice system; law enforcement; court system; prosecution and defense; trial process; corrections. (Semester)

**Crime in America.** American crime problems in historical perspective; social and public policy factors affecting crime; impact and crime trends; social characteristics of specific crimes; prevention of crime. (Semester)

**Court Systems and Practices.** The judiciary in the criminal justice system; structure of American court system; prosecution; right to counsel; pre-trial release; grand juries; adjudication process; types and rules of evidence and sentencing. Fieldwork/Job Shadowing Desirable. (Semester)

**Fundamentals of Criminal Law.** A study of the nature of criminal law; philosophical and historical development; major definitions and concepts; classification of crime; elements of crimes and penalties using Texas statutes as illustrations; criminal responsibility. (Semester)

**Legal Aspects of Law Enforcement.** Police authority; responsibilities; constitutional constraints; laws of arrest, search, and seizure; police liability. (Semester)

**Texas State and Local Government.** This course is an introduction to Texas state and local government. The course includes an introduction to a framework for analyzing Texas government and politics and the constitutional basis for the processes, the institutions, and the policies of Texas government and politics. (Semester)

#### 2. Law and Criminal Justice (Para-legal Emphasis)

**Support and Career Exploratory** (See *Appendix 3.*)

**Introduction to Paralegal Studies.** This course provides an overview of the paralegal profession including ethical obligations, regulation, professional trends and issues, and the paralegal's role in assisting the delivery of legal services. (Semester)

**Legal Research.** This course provides a working knowledge of the fundamentals of effective legal research. Topics include law library techniques, computer assisted legal research, briefs, and legal memoranda. (Semester)

**Legal Writing.** This course provides a working knowledge of the fundamentals of effective legal writing. Topics include briefs, legal memoranda, case and fact analysis, citation forms, and legal writing styles. (Semester)

**Introduction to Law.** This course provides an overview of the law and the legal system. Topics include legal concepts, procedures, terminology and current issues in law. (Semester)

**Contracts.** This course presents fundamental concepts of issue identification and contract law with emphasis on the paralegal's role. Topics include business organizations, case briefing, and formation, performance, and enforcement of contracts under the common law and the Uniform Commercial Code. (Semester)

### 3. Public Management and Administration and Government

**Support and Career Exploratory** (See *Appendix 3.*)

**United States Government.** This course is an introduction to United States national government. The course includes a framework for understanding United States government and politics and the constitutional basis for the processes, the institutions, and the policies of United States government and politics. (Semester)

**Texas State and Local Government With Emphasis On Land Use Policy.** This course is an introduction to Texas state and local government with an emphasis on land use policy. The course includes the powers and practices of local governments in controlling land use. Topics include annexation, extraterritorial jurisdiction (ETJ), the legal issue of "takings," eminent domain, zoning, Municipal Utility Districts (MUDs), environmental impact considerations, subdivision ordinances, and deed restrictions. (Semester)

**Principles of Macroeconomics.** Deals with consumers as a whole, producers as a whole, the effects of government spending and taxation, and the monetary policy of the Federal Reserve. Macroeconomics is concerned with unemployment, inflation and the business cycle. (Semester)

**Principles of Management.** Management theories and analysis of basic management functions: planning, organizing, staffing, directing, and controlling for establishing and accomplishing business objectives. Case studies are utilized. (Semester)

**Fundamentals of Public Speaking.** A study of the basic principles and techniques for the research, composition, organization and delivery of speeches for various purposes. The course concentrates on practical experience in developing speaking and listening abilities. (Semester)

- 4. Concentration in Humanities** (Four or more credits drawn from foreign language, debate or advanced-level courses in government, history, economics psychology or another humanities area) If a student has an interest in any legal and protective services-related career, a concentration in humanities provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement courses in government, communications, psychology, economics and languages.

**Support and Career Exploratory** (See *Appendix 3.*)

### Degree Opportunities at Austin Community College

Government (A.A.)

History (A.A.)

Foreign Language (A.A.)

Speech (A.A.)  
Criminal Justice (A.A.S.)  
Legal Assistant (A.A.S.)  
Fire Protection (A.A.S.)

**Certifications**

*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 10: Manufacturing and Construction

### Descriptions:

**Manufacturing:** Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

**Construction:** Designing, planning, managing, building, and maintaining physical structures and the larger building environment including roadways and bridges and industrial, commercial and residential facilities and buildings.

Top 25	Manufacturing – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Team Assemblers	1,860	30
2	Maintenance & Repair Workers, General	1,800	29
3	Welders, Cutters, Solderers, & Brazers	1,795	29
4	First-Line Supervisors/Managers of Production & Operating Workers	1,515	24
5	Production Workers,	1,490	24
6	Helpers--Production Workers	1,415	23
7	Machinists	930	15
8	Inspectors, Testers, Sorters, Samplers, & Weighers	900	14
9	Production, Planning, & Expediting Clerks	870	14
10	Assemblers and Fabricators,	785	13
11	Sheet Metal Workers	670	11
12	Electrical & Electronic Equipment Assemblers	660	11
13	Packaging & Filling Machine Operators & Tenders	640	10
14	Weighers, Measurers, Checkers, & Samplers, Recordkeeping	570	9
15	Roustabouts, Oil & Gas	565	9
16	Industrial Production Managers	515	8
17	Computer-Controlled Machine Tool Operators, Metal & Plastic	450	7
18	Structural Iron & Steel Workers	415	7
19	Prepress Technicians & Workers	385	6
20	Printing Machine Operators	370	6
21	Chemical Plant & System Operators	345	6
22	Cutting, Punching, & Press Machine Setters, Operators, & Tenders, Metal & Plastic	320	5
23	Pressers, Textile, Garment, & Related Materials	300	5
24	Bindery Workers	295	5
25	Petroleum Pump System Operators, Refinery Operators, & Gaugers	285	
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>20,145</b>	<b>320</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

Top 25	Construction – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	First-Line Supervisors/Managers of Construction Trades & Extraction Workers	2,400	38
2	Construction Laborers	1,990	32
3	Electricians	1,965	31
4	Carpenters	1,315	21
5	Plumbers, Pipefitters, & Steamfitters	1,160	19
6	Helpers--Installation, Maintenance, & Repair Workers	1,040	17
7	Painters, Construction & Maintenance	1,015	16
8	Helpers--Electricians	1,260	20
9	Heating, Air Conditioning, & Refrigeration Mechanics & Installers	760	12
10	Construction Managers	755	12
11	Helpers--Pipelayers, Plumbers, Pipefitters, & Steamfitters	695	11
12	Construction Trades and Related Workers,	585	9
13	Installation, Maintenance, and Repair Workers,	420	7
14	Architectural & Civil Drafters	405	6
15	Cabinetmakers & Bench Carpenters	405	6
16	Helpers--Carpenters	400	6
17	Surveying & Mapping Technicians	290	5
18	Helpers--Brickmasons, Blockmasons, Stonemasons, & Tile & Marble Setters	290	5
19	Cement Masons & Concrete Finishers	280	4
20	Electrical Power-Line Installers & Repairers	265	4
21	Brickmasons & Blockmasons	260	4
22	Roofers	240	4
23	Helpers, Construction Trades,	235	4
24	Insulation Workers, Floor, Ceiling, & Wall	215	3
25	Security & Fire Alarm Systems Installers	210	3
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>18,855</b>	<b>299</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

### AISD CATE “Manufacturing” and “Construction” Enrollment (Fall 2003-2004)

	<u>Manufacturing</u>	<u>Construction</u>
<b>District Total</b>	134	0
Bowie	26	0
Crockett	39	0
Lanier	69	0

## Areas of Concentration

### 1. Welding

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Welding Using Multiple Processes.** An overview of the basic welding processes, including oxy-fuel welding and cutting, shielded metal arc (SMAW), gas metal arc (GMAW), and gas tungsten arc welding (GTAW) and flux cored arc welding (FCAW). (Semester)

**Introduction to Blueprint Reading For Welders.** A study of industrial blueprints. Emphasis placed on terminology, symbols, graphic description, and welding processes, including systems of measurement and industry standards. Interpretation of plans and drawings used by industry. (Semester)

**Introduction to Layout And Fabrication.** A fundamental course in layout and fabrication related to the welding industry. Major emphasis on structural shapes used in construction. (Semester)

**Introduction to Oxy-Fuel Welding And Cutting.** An introduction to oxy-fuel welding and cutting, including history and future in welding, safety, setup and maintenance of oxy-fuel welding and cutting equipment and supplies. (Semester)

**Introduction to Shielded Metal Arc Welding (SMAW).** An introduction to the shielded metal arc welding process. Emphasis placed on power sources, electrode selection, oxy-fuel cutting and various joint designs. Instruction provided in SMAW fillet welds in various positions. (Semester)

**Mathematics for Measurement.** A course designed for non-mathematics and non-science majors. Topics include logic, variation, functions, equivalence, congruence, right triangle geometry, and other measurement topics. (Semester)

### 2. Quality Assurance

**Support and Career Exploratory** (See *Appendix 3*.)

**Quality Assurance.** Information on quality assurance principles and applications; designed to introduce the student to the quality assurance profession. (Semester)

**Quality Control.** Information on quality control principles and applications. Designed to introduce the student to the quality control profession. (Semester)

**Teaming.** A study in group dynamics, synergy, team building, consensus decision making, active listening skills, win/win resolution, confrontation skills, creativity, and brainstorming. Examination of team presentation skills, overall team communication, and resolving personality conflicts. (Semester)

**Statistical Process Control.** Components of statistics including techniques of collection, presentation, analysis and interpretation of numerical data as applied to statistical control. Stresses application of correlation methods, analysis of variance, dispersion, sampling quality control, reliability, mathematical models, and programming. (Semester)

**Total Quality Management.** The study of integrating work processes using team participation through employee empowerment and teamwork emphasizing the philosophy of customer services and satisfaction. Job Shadowing/Internship desirable. (Semester)

### 3. Electronics

**Support and Career Exploratory** (See *Appendix 3.*)

**Electricity Principles.** Principles of electricity as required by HVAC technicians including proper use of test equipment, A/C and D/C circuits, and component theory and operation. (Semester)

**DC Circuits.** A study of the fundamentals of direct current including Ohm's law, Kirchoff's laws and circuit analysis techniques. Emphasis on circuit analysis of resistive networks and DC measurements. Includes steady state analysis of magnetism, electromagnetism, inductance, and capacitance. (Semester)

**AC Circuits.** A study of the fundamentals of alternating current including series and parallel AC circuits, phasors, capacitive and inductive networks, transformers, and resonance. (Semester)

**Electronic Fabrication.** A study of electronic circuit fabrication techniques including printed circuit boards, wire wrapping, bread boarding, and various soldering techniques. Students will need to purchase approximately \$100 worth of supplies the first 3 weeks of class for a project required by each student. (Semester)

**Digital Fundamentals.** An entry level course in digital electronics covering number systems, binary mathematics, digital codes, logic gates, Boolean algebra, Karnaugh maps, and combination logic. Emphasis on circuit logic analysis and troubleshooting digital circuits. (Semester)

**Solid State Devices.** A study of diodes and other semiconductor devices, including analysis of static and dynamic characteristics, biasing techniques, and thermal considerations of solid state devices. (Semester)

### 4. Building Construction and Technology

**Support and Career Exploratory** (See *Appendix 3.*)

**Construction Methods and Materials.** An introduction to construction materials and methods and their applications. This is a hands-on survey course which has four components: construction management, concrete/masonry, carpentry, and woodworking. Students learn to use math, blueprints, building specifications, optical leveling equipment, hand tools, portable power tools, and stationary power tools in a sequence of learning activities designed for students to acquire entry level skills and knowledge of the construction industry. (Semester)

**Residential and Light Commercial Blueprint Reading.** Blueprint reading covering the theory of projection, architectural and engineering symbols, relationship of views, and measuring with emphasis on residential and light commercial construction. (Semester)

**Building Codes and Inspections.** An examination of the building codes and standards applicable to building construction and inspection processes. (Semester)

**Conventional Wall Systems.** Instruction on conventional wall and floor systems, and installation of trusses of wood frame construction. Topics include math to solve construction problems, identification of components, slab and building layout, build up of floor and wall members, construction of a floor and wall system and layout and installation of wood trusses. (Semester)

**OSHA Regulations -- Construction Industry.** A study of Occupational Safety and Health Administration (OSHA) regulations pertinent to the construction industry. (Semester)

## 5. Architectural Drafting and Design

**Support and Career Exploratory** (See *Appendix 3*.)

**Technical Drafting.** Introduction to the principles of drafting to include terminology and fundamentals, including size and shape descriptions, projection methods, geometric construction, sections, auxiliary views, and reproduction processes. Instructs students in modern graphics and modeling fundamentals for engineering design. Students will be introduced to freehand sketching, multi-view orthographic projection, shape modeling and its applications in computer-aided drafting and design (CADD). Studies will include graphic geometry and projection techniques, visualization methods, pictorial drawings, geometric modeling techniques for CADD, drafting practices, and manufacturing processes and materials documentation. (Semester)

**Construction Methods and Materials.** An introduction to construction materials and methods and their applications. This is a hands-on survey course which has four components: construction management, concrete/masonry, carpentry, and woodworking. Students learn to use math, blueprints, building specifications, optical leveling equipment, hand tools, portable power tools, and stationary power tools in a sequence of learning activities designed for students to acquire entry level skills and knowledge of the construction industry. (Semester)

**Architectural Drafting -- Residential.** Topics will cover the principles and practices used in residential construction. This course is an introduction to the preparation of architectural construction documents for a single family residence. (Semester)

**Intermediate Computer-Aided Drafting.** A continuation of practices and techniques used in basic computer-aided drafting emphasizing advanced dimensioning techniques, the development and use of prototype drawings, construction of pictorial drawings, construction of three-dimensional drawings, interfacing 2D and 3D environments and extracting data. (Semester)

**Civil Drafting.** An in-depth study of drafting methods and principles used in public works civil engineering. (Semester)

## 6. Home and Commercial Repair-Related Occupations

**Support and Career Exploratory** (See *Appendix 3*.)

**A/C Control Principles.** A basic study of electrical, pressure, and temperature controls including motor starting devices, operating relays, and troubleshooting safety controls and devices. Emphasis on use of wiring diagrams to analyze high and low voltage circuits. A review of Ohm's law as applied to A/C controls and circuits. (Semester)

**Refrigeration Principles.** An introduction to the refrigeration cycle, basic thermodynamics, heat transfer, temperature/pressure relationship, safety, refrigeration containment, and refrigeration components. (Semester)

**Residential Air Conditioning.** A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems. (Semester)

**Gas And Electric Heating.** A study of the procedures and principles used in servicing heating systems including gas fired and electric furnaces. (Semester)

- 7. Concentration in Mathematics and Science** ( Four credits in mathematics and four credits in science with at least one AP credit in science.) If a student has an interest in any manufacturing or construction-related career, a concentration in mathematics and science provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement mathematics, physics and technology courses.

**Support and Career Exploratory** (See *Appendix 3.*)

### **Degree Opportunities at Austin Community College**

Architectural Specialty (A.A.S)  
Building Construction Technology (A.A.S.)  
Electronics (A.A.S.)  
Heating, Air Conditioning & Refrigeration Technology (A.A.S.)  
Land Surveying Technology/Geomatics (A.A.S.)  
Quality Assurance (A.A.S.)  
Semi-Conductor Manufacturing Technology (A.A.S.)  
Welding Technology (A.A.S.)

### **Certifications**

Carpentry  
Computer Electronics/Telecommunications  
Electronics Technician  
Engineering Technology  
Heating, Air Conditioning and Refrigeration Technology  
Robotics/Instrumentation and Control Technology  
Semi-Conductor Manufacturing Technology  
Woodworking

*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

## Cluster 11: Engineering, Technical Services and Transportation

### Descriptions:

**Scientific Research, Engineering and Technical Services:** Planning, managing and providing scientific research and professional and technical services (e.g. physical science, social science, engineering) including laboratory and testing services, and research and development services.

**Transportation:** Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

Top 25	Scientific Research, Engineering and Technical Services – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Mechanical Engineers	1,085	17
2	Engineering Managers	610	10
3	Industrial Machinery Mechanics	565	9
4	Drafters, Engineering, & Mapping Technicians,	495	8
5	Electrical & Electronic Engineering Technicians	425	7
6	Electronics Engineers, Ex Computer	415	7
7	Electrical Engineers	410	7
8	Engineers,	395	6
9	Civil Engineers	365	6
10	Civil Engineering Technicians	325	5
11	Aerospace Engineers	315	5
12	Chemists	275	4
13	Maintenance Workers, Machinery	250	4
14	Chemical Equipment Operators & Tenders	235	4
15	Life Scientists,	190	3
16	Industrial Engineering Technicians	185	3
17	Material Recording, Scheduling, Dispatching, & Distributing Workers,	150	2
18	Mechanical Engineering Technicians	130	2
19	Chemical Engineers	115	2
20	Petroleum Engineers	105	2
21	Physical Scientists,	100	2
22	Biochemists & Biophysicists	85	1
23	Materials Scientists	75	1
24	Materials Engineers	40	1
25	Engineering Technicians, Except Drafters,	15	0
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>7,355</b>	<b>118</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

Top 25	Transportation – Occupational Titles	Annual Demand	
		Texas	AISD 1.6% of State
1	Laborers & Freight, Stock, & Material Movers, Hand	6,720	108
2	Truck Drivers, Heavy & Tractor-Trailer	4,020	64
3	Packers & Packagers, Hand	2,815	45
4	Automotive Service Technicians & Mechanics	2,325	37
5	Truck Drivers, Light or Delivery Services	2,255	36
6	Shipping, Receiving, & Traffic Clerks	1,730	28
7	First-Line Supervisors/Managers of Mechanics, Installers, & Repairers	1,585	25
8	Industrial Truck & Tractor Operators	1,100	18
9	Driver/Sales Workers	980	16
10	Bus Drivers, School	955	15
11	Operating Engineers & Other Construction Equipment Operators	795	13
12	Flight Attendants	740	12
13	Bus & Truck Mechanics & Diesel Engine Specialists	640	10
14	Bus Drivers, Transit & Intercity	565	9
15	First-Line Supervisors/Managers of Transportation & Material-Moving Machine & Vehicle Operators	535	9
16	Automotive Body & Related Repairers	525	8
17	Mobile Heavy Equipment Mechanics, Ex Engines	500	8
18	Transportation, Storage, & Distribution Managers	490	8
19	Aircraft Mechanics & Service Technicians	490	8
20	Material Moving Workers,	475	8
21	Airline Pilots, Copilots, & Flight Engineers	325	5
22	Excavating & Loading Machine & Dragline Operators	290	5
23	Taxi Drivers & Chauffeurs	275	4
24	Cargo & Freight Agents	235	4
25	Vehicle & Mobile Equipment Mechanics, Installers, & Repairers,	195	3
<b>TOP 25 TOTAL ANNUAL DEMAND</b>		<b>31,560</b>	<b>506</b>
Source: Texas Workforce Commission. <i>Texas Workforce Long-Term Projections: 2000-2010.</i>			

## AISD CATE Enrollment (Fall 2003-2004)

	<u>Drafting</u>	<u>Technology</u>	<u>Transportation</u>
<b>District Total</b>	175	372	264
Akins	47	49	1
Anderson	23	1	2
Austin	34	58	17
Bowie	24	0	0
Crockett	0	0	83
Johnston	0	0	70
Lanier	21	106	0
LBJ	0	134	2
McCallum	21	0	3
Reagan	5	0	79
Travis	0	24	7

### Areas of Concentration

- 1. Concentration in Mathematics and Science** (Four credits in mathematics and four credits in science with at least one AP credit in science.) If a student has an interest in any engineering, technology or transportation-related career, a concentration in mathematics and science provides a strong foundation for the career path. The emphasis would be college-preparatory and Advanced Placement mathematics and science courses with an emphasis in technology and design.

*Support and Career Exploratory (See Appendix 3.)*

- 2. Pre-Engineering** (Implement Project Lead the Way or align with ACC) (Texas has identified PLTW courses as Advanced Technical Credit State-wide Articulated courses and the University of Houston is a Affiliate Partner for PLTW.)

*Support and Career Exploratory (See Appendix 3.)*

**(PLTW) Principles of Engineering.** A course that helps students understand the field of engineering/engineering technology. Exploring various technology systems and manufacturing processes help students learn how engineers and technicians use math, science and technology in an engineering problem solving process to benefit people. The course also includes concerns about social and political consequences of technological change.

**(PLTW) Digital Electronics.** A course in applied logic that encompasses the application of electronic circuits and devices. Computer simulation software is used to design and test digital circuitry prior to the actual construction of circuits and devices.

**(PLTW) Introduction to Engineering Design.** A course that teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed and communicated using solid modeling computer design software.

**(PLTW) Computer Integrated Manufacturing.** A course that applies principles of robotics and automation. The course builds on computer solid modeling skills developed in Introduction to Engineering Design, and Design and Drawing for Production. Students use CNC equipment to produce actual models of their three-dimensional designs. Fundamental concepts of robotics used in automated manufacturing, and design analysis are included. **OR (PLTW) Civil Engineering and Architecture.** This course provides an overview of the fields of Civil Engineering and Architecture, while emphasizing the interrelationship and dependence of both fields on each other. Students use state of the art software to solve real world problems and communicate solutions to hands-on projects and activities. This course covers topics such as: 1) the Roles of Civil Engineers and Architects, 2) Project Planning, 3) Site Planning, 4) Building Design, and 5) Project Documentation and Presentation

**(PLTW) Engineering Design and Development.** An engineering research course in which students work in teams to research, design and construct a solution to an open-ended engineering problem. Students apply principles developed in the four preceding courses and are guided by a community mentor. They must present progress reports, submit a final written report and defend their solutions to a panel of outside reviewers at the end of the school year.

### **Aligned with ACC**

**(ACC) Introduction to Engineering.** Introduction to engineering as a discipline and profession. Includes instruction in the application of mathematical and scientific principles to the solution of practical problems. A broad range of problems will be considered in order to introduce the student to various engineering majors and careers. (Semester)

**(ACC) Technical Drafting.** Introduction to the principles of drafting to include terminology and fundamentals, including size and shape descriptions, projection methods, geometric construction, sections, auxiliary views, and reproduction processes. Instructs students in modern graphics and modeling fundamentals for engineering design. Students will be introduced to freehand sketching, multi-view orthographic projection, shape modeling and its applications in computer-aided drafting and design (CADD). Studies will include graphic geometry and projection techniques, visualization methods, pictorial drawings, geometric modeling techniques for CADD, drafting practices, and manufacturing processes and materials documentation. (Semester)

**(ACC) Intermediate Computer-Aided Drafting.** A continuation of practices and techniques used in basic computer-aided drafting emphasizing advanced dimensioning techniques, the development and use of prototype drawings, construction of pictorial drawings, construction of three-dimensional drawings, interfacing 2D and 3D environments and extracting data. (Semester)

### **3. Drafting and Design (Blend Project Lead the Way with ACC) (Texas has identified PLTW courses as Advanced Technical Credit State-wide Articulated courses.)**

#### **Support and Career Exploratory (See Appendix 3.)**

**(PLTW) Introduction to Engineering Design.** A course that teaches problem-solving skills using a design development process. Models of product solutions are created, analyzed and communicated using solid modeling computer design software.

**(ACC) Technical Drafting.** Introduction to the principles of drafting to include terminology and fundamentals, including size and shape descriptions, projection methods, geometric construction, sections, auxiliary views, and reproduction processes. Instructs students in modern graphics and modeling fundamentals for engineering design. Students will be introduced to freehand sketching,

multi-view orthographic projection, shape modeling and its applications in computer-aided drafting and design (CADD). Studies will include graphic geometry and projection techniques, visualization methods, pictorial drawings, geometric modeling techniques for CADD, drafting practices, and manufacturing processes and materials documentation. (Semester)

**(ACC) Intermediate Computer-Aided Drafting.** A continuation of practices and techniques used in basic computer-aided drafting emphasizing advanced dimensioning techniques, the development and use of prototype drawings, construction of pictorial drawings, construction of three-dimensional drawings, interfacing 2D and 3D environments and extracting data. (Semester)

**(ACC) Blueprint Reading and Sketching.** An introduction to reading and interpreting the "working drawings" for manufactured products and associated tooling. Use of sketching techniques to create pictorial and multiple-view drawings of manufactured parts. A survey course for students enrolled in vocational-technical majors. Methods of representation used in construction trades with emphasis on rough layouts and blueprint reading, with a section on materials take-off and cost estimating. (Semester)

**(ACC) Mechanical Drafting.** An intermediate course covering detail drawings with proper dimensioning and tolerances, use of sectioning techniques, common fasteners, and 3D isometric and oblique drawings, including bill of materials. This is an advanced course in modern graphic drawing and design. Topics covered include dimensioning techniques, drafting standards, pictorial drawings, auxiliary views, sections, fasteners, assembly and detail drawings. The engineering design process is also covered. (Semester)

## 4. Automotive Repair

**Support and Career Exploratory** (See *Appendix 3*.)

**Introduction to Automotive Technology.** An introduction to the automotive industry including automotive history, safety practices, shop equipment and tools, vehicle subsystems, service publications, fasteners, professional responsibilities, and automotive maintenance. Emphasis is on automobile construction, major components, basic systems and their repair and maintenance. (Semester)

**Automotive Electrical Systems.** An overview of automotive electrical systems including topics in operational theory, testing, magnetism, diagnosis, and repair of batteries, charging and starting systems, and electrical accessories. Emphasis on electrical schematic diagrams, chassis wiring and switches, and service manuals. Prepares students for ASE certification tests. (Semester)

**Automotive Engine Repair.** Fundamentals of engine operation, diagnosis and repair including lubrication systems and cooling systems. Emphasis on overhaul of selected engines, identification and inspection, measurements, and disassembly, repair, and reassembly of the engine. Prepares students for ASE certification tests. (Semester)

**Automotive Service.** Mastery of automotive vehicle service and component systems repair. Emphasis on mastering current automotive competencies covered in related theory courses in specialized areas previously obtained by the student. The course will enhance the student's competency of NATEF task listings and give additional preparation for ASE testing and employment. (Semester)

**Engine Performance Analysis I.** Theory, operation, diagnosis, and repair of basic engine dynamics, both early and electronic ignition systems, fuel delivery systems, including carburetion and throttle

body injection repair, and emission control systems. Use, care, and maintenance of basic engine performance diagnostic equipment. Prepares students for ASE certification tests. (Semester)

**Automotive Electronics.** Topics address electrical principles, semiconductor and integrated circuits, digital fundamentals, microcomputer systems, computerized engine controls, and electrical test. (Semester)

### **Alternative Alignment -Texas State Technical College, Waco for Auto Collision & Management Technology**

#### **Degrees and Certificates:**

Auto Collision & Management Technology - Associate of Applied Science Degree  
Auto Body Collision Repair - Certificate of Completion  
Auto Body Refinishing - Certificate of Completion  
General Motors Body Service Educational Program - Associate of Applied Science Degree  
T-TEN Collision Repair - Associate of Applied Science Degree  
T-TEN Collision - Certificate of Completion  
T-TEN Refinishing - Certificate of Completion

### **Alternative Alignment -Texas State Technical College, Waco for Diesel Mechanics, Heavy Construction Equipment**

#### **Degrees and Certificates**

Agriculture Equipment - Associate of Applied Science Degree  
Agriculture Equipment - Certificate of Completion  
CAT Dealer Prep Program - Associate of Applied Science Degree  
Construction Equipment - Associate of Applied Science Degree  
Construction Equipment - Certificate of Completion  
Heavy Truck - Associate of Applied Science Degree  
Heavy Truck - Certificate of Completion  
Marine - Associate of Applied Science Degree  
Marine - Certificate of Completion  
Outdoor Power Equipment - Associate of Applied Science Degree  
Outdoor Power Equipment - Certificate of Completion

## **5. Transportation Operations and Systems**

**Support and Career Exploratory** (*See Appendix 3.*)

**Operator Training:** Consider Partnerships with, Capital Metropolitan Transportation Authority, International Union of Operating Engineers, etc.)

**Logistics/Materials Handling/Supply Chain Distribution** (*Align with ACC courses using Ferris State University, Big Rapids, MI as model (See Appendix 5.).* In addition, the

**Institute of Logistical Management is a distance learning school that offers certification in transportation and logistics.**

**Introduction to Business Logistics.** A systems approach to managing activities associated with traffic, transportation, inventory management and control, warehousing, packaging, order processing, and materials handling.

**Purchasing.** A study of the purchasing process and the basis of sound purchasing decisions; materials management; selection and evaluation of suppliers/vendors; price, quality, and value determinants; and issues that require legal or ethical consideration.

**Transportation.** The various modes of transportation will be studied within the context of a physical distribution system. Actual transportation firms will be studied as a term project. Actual cases will be studied.

**Export/Import Procedures & Org.** Concepts and elements involved in international business in general and of commerce in particular, standard organizations within private business and government for conducting and controlling exports and imports and transportation and banking procedures for facilitating those procedures.

**Supply Chain Management.** Introduction to logistics management as a process of value added activities that synchronize supply and demand. Extensive review and analysis of transportation and physical distribution issues including channel management. Additional topics include warehousing operations, packaging and regulatory laws.

## **Degree Opportunities at Austin Community College**

Auto Technology (A.A.S.)  
Chemistry (A.S.)  
Engineering (A.S.)  
Engineering Design Graphics (A.A.S.)  
Mathematics (A.S.)  
Physics & Astronomy (A.S.)  
Technical Communications (A.A.S.)

## **Certifications**

Engineering Design Graphics Certificate  
Automotive Brake and Suspension Certificate  
Automotive Drive Train Specialist  
Automotive Engine Performance Specialist Certificate  
Automotive Technical Certificate  
Small Engine Repair Certificate  
Motorcycle Repair Certificate  
Marine Engine Repair Certificate  
Global Logistics Certificate (Ferris State University, Michigan)  
*(see Appendix 8 for additional certifications, competency assessments and licensures.)*

**Examples of Areas of Concentration  
Mapped in Six-year Pathways**

**EXAMPLE: Career Cluster: Agriculture and Natural Resources with a Concentration in Environmental Sciences (Six-Year Pathway)  
 AISD Recommended Graduation Program (24 Credit/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) Option: 9 <sup>th</sup> -Grade Catch-up Course (0)	Algebra I (1) Option: 9 <sup>th</sup> -Grade Catch-up Course (0)	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Systems I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Environmental Systems (AISD) (1)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History -Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Intro Environmental Science (ACC)* (3) Environ Regulations Overview (2)
	12	CP English IV (1) Option: 12 <sup>th</sup> -Grade Catch-up Course (0)	Pre-Calculus Option: 12 <sup>th</sup> -Grade Catch-up Course (0)	Physics (1)	U.S. Government/ Economics (0.5 each)		Ecology & Evolutionary Biology (ACC)* (3) Environmental Biology Lecture/Lab (3)
Career Cluster Specialization	13 1 <sup>st</sup> Semester	English Composition I (3)	College Algebra (3)	General Chemistry I (4)	Inter-Personal Communication (3)	Personal Computing (3)	
Environmental Studies	13 2 <sup>nd</sup> Semester	Technical & Business Writing (3)	Elementary Statistics (3)	General Chemistry II (4) Physical Geology (4)		Humanities/Fine Arts Elective (3)	
	14 1 <sup>st</sup> Semester			Lab Environ. Geology (1) Aquatic Biology (4)	Texas State & Local Government (3)		Intro Environ Field Methods (3) Chemistry of Natural Waters (4)
ACC: Associate of Applied Science (67-68 hours, 5 semester program collapsed into 4)	14 2 <sup>nd</sup> Semester			Math/Science Elective (3-4)			Field Methods of Natural Waters (4) Environmental Techn. Internship (4)

\* = Courses proposed for dual credit; # = Courses already approved for dual credit with ACC; + = AP Courses; \$ = Tech Prep Courses.  
 Credits: AISD credits are Carnegie credits in parenthesis (). ACC credits are semester hours in parenthesis ().

**EXAMPLE: Career Cluster: Arts, AV Technology & Communications with a Concentration in Visual & Graphic Arts (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1)	Speech (0.5) PE/Health (1)	Introduction to Visual Communication Processes AISD (1)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	Foreign Lang I (1) U.S. History-Since Reconstruction (1)	PE/Health (0.5)	Basic Graphic Design (ACC)* (3) Digital Publishing I (4)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-Calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	Foreign Lang II (1) U.S. Government/ Economics (0.5 each)		Digital Imaging I (ACC)* (4) Special Topics (3)
Career Cluster Specialization	13 1 <sup>st</sup> Semester						Basic Illustration (4) Art Direction I (4) Typographic Design (4)
	13 2 <sup>nd</sup> Semester						Design Commun. I (4) Illustration Techniq. (4) Digital Publishing II (4)
ACC Certificate (54 hours, 5- semester program collapsed into 4)	14 1 <sup>st</sup> Semester						Design Commun. II (4) Illustration Concepts (4)
	14 2 <sup>nd</sup> Semester					Restrictive Elective (4)	Portfolio Development for Graphic Design (4)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Business, Finance & Marketing with a Concentration in Office Administration (Six-Year Pathway)  
 AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
<b>Foundation AISD Recommended Graduation Program (24 Credits)</b>	9	CP English I (1) Option: 9 <sup>th</sup> -Grade Catch-up Course (0)	Algebra I (1) Option: 9 <sup>th</sup> -Grade Catch-up Course (0)	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Business Computer Info Sys II AISD (1) Introduction to Business (0.5)
	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Bus Communications I (ACC)* (3) Bus Machine Appl Data Entry (2)
<b>Career Cluster Core</b>	12	CP English IV (1) Option: 12 <sup>th</sup> -Grade Catch-up Course (0)	Pre-Calculus Option: 12 <sup>th</sup> -Grade Catch-up Course (0)	Physics (1)	U.S. Government/ Economics (0.5 each)		Administrative Office Procedures I (ACC)* (3) Document Formatting and Skillbuilding (3)
	13 1 <sup>st</sup> Semester						Business Math (3) Spreadsheets-Excel (4) Admin. Systems Office Mgmt (3)
<b>Administrative Assistant ACC Certificate (34 hours 2 Semesters)</b>	13 2 <sup>nd</sup> Semester						Access (3) Adm. Office Proc. II (4) Integrated Software App III (3) Presentation Software- PowerPoint (3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
 Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Education and Training Services with a Concentration in Teacher Cadet/Educ. Program (Six-Year Pathway)  
AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) <b>Option: Integrated Physics &amp; Chemistry (1)</b>	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	<b>Option: Biology (1)</b>	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Child Development (0.5)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)		Schools and Society- ACC* (3) Intro Psychol-ACC* (3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-Calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)	Teacher Cadet Unit 3 "Teacher and Teaching" (0.5) <b>Option: Teacher Education I (2.0)</b>	School Age Child- ACC* (3) Family and Community- ACC* (3)
Career Cluster Specialization Grade 4-8 Certification ACC: Associate of Arts 60-62 hours	13 1 <sup>st</sup> Semester	English Composition I (3)	College Algebra (3)	Natural Science (3)	U.S. History I (3)	Oral Communication (3)	
	13 2 <sup>nd</sup> Semester	English Composition II (3)		Natural Science (3)	U.S. History II (3)		Mathematics for Middle Grade Teacher I (3)
	14 1 <sup>st</sup> Semester	Humanities (3)			U.S. Government (3)	Visual Performing Arts (3)	Mathematics for Middle Grade Teacher II (3)
	14 2 <sup>nd</sup> Semester	Humanities (3)		Restrictive Electives (6)	Texas State and Local Government (3)		Child Growth Thru Adolescence-(3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC;  
Credits: AISD credits are Carnegie credits in parenthesis (). ACC credits are semester hours in parenthesis ().  
+ AP Courses; \$ Tech Prep Courses.

**EXAMPLE: Career Cluster: Medical Science and Health Services with a Concentration in Pre-Nursing (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)		World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Health Science Technology I (1.0)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Medical Terminology - ACC* (3) Foundations of Nursing Practice ACC* (2)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Intro Psychology ACC# (3) Anatomy & Physiology I ACC# (4)
Career Cluster Specialization	13 1 <sup>st</sup> Semester		College Algebra (3)	Anatomy & Physiology II ACC# (4) Introduction to Microbiology (4)		Pharmacology Health Professions (3) Nursing Skills I (1)	Clinical I Nursing (2) Common Concepts Adult Health (4)
	13 2 <sup>nd</sup> Semester	Oral Communications (3)				Nursing Skills II (1) Complex Concepts Adult Health (4) Clinical II-Nursing (3)	Intro-Community-Based Nursing (2) Human Growth (3)
ACC: Associate of Applied Science 70 hours	14 1 <sup>st</sup> Semester	English Composition I (3)				Nursing Care Childbearing (4) Nursing Care Childbearing Clinic (2)	Mental Health Nurs. (2) Mental Health Clinic (1)
	14 2 <sup>nd</sup> Semester	Humanities/Fine Arts (3)				Clinical III-Nursing (3) Management Client Care (2)	Management Clinic (3) Advanced Concept Adult Health (3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Hospitality and Tourism with a Concentration in Culinary Arts (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Nutrition and Food Science (0.5)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Intro to Foods ACC*(3) Intro to Hospitality Industry ACC* (3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-Calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Sanitation and Safety ACC* (3) Food Production Plan (Math) ACC* (2)
Career Cluster Specialization  Culinary Arts  ACC: Associate of Applied Science	13 1 <sup>st</sup> Semester	Humanities/Fine Arts (3)		College Mathematics (3)		Nutrition for Food Service Prof (3) Basic Food Prep (3)	Fundamentals of Baking (3)
	13 2 <sup>nd</sup> Semester	Oral Communications (3)				American Regional Cuisine (3) Hospitality HR Mgrt (3)	Hotel Restaurant Institutional Meat (3) Purchasing Rec. Store Food (3)
68 hours five semesters collapsed into 4	14 1 <sup>st</sup> Semester	English Composition I (3)				Special Topics Culinary Arts (3) Charcuterie (3)	Dining Room Service (3) Elective (3)
	14 2 <sup>nd</sup> Semester				Social and Behavioral Science (3)	International Cuisine (3) Restrictive Elective (3)	Culinary Practicum (2)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Human Services with a Concentration in Fire Protection (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Emergency Communications (0.5)
	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Fundamentals Fire Protection ACC* (3) Hazardous Materials I ACC* (3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Fire Prevention Codes Inspections ACC* (3) Fire and Arson Investigation I ACC* (3)
Career Cluster Specialization Fire Protection	13 1 <sup>st</sup> Semester	English Composition I (3)	College Algebra (3)				Industrial Fire Protection (3) Fire Elective (3)
	13 2 <sup>nd</sup> Semester				Texas State and Local Government (3)	Unrestrictive Elective (3)	Fire Administration I (3) Fire Elective (3)
ACC: Associate of Applied Science 63 hours	14 1 <sup>st</sup> Semester			Natural Science (3)		Fundamentals of Public Speaking (3)	Methods of Teaching (3) Fire Elective (3)
	14 2 <sup>nd</sup> Semester					Ethics (3) Personal Computing (3)	Fire Administration II (3) Firefighting Strategies and Tactics (3) Fire Elective (3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Information Technology with a Concentration in Local Area Network Systems (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1)	Speech (0.5) PE/Health (1)	Basic Computer Technology (A+) (0.5) Networking Essentials (N Plus) (0.5)
	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1)	PE/Health (0.5)	Fundamentals of Networking ACC\$ (3) Introduction to Computing ACC\$ (3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	Foreign Lang II (1) U.S. Government/ Economics (0.5 each)		Fundamentals of Programming ACC\$ (3) Web Page Programming ACC\$ (3)
Career Cluster Core	13 1 <sup>st</sup> Semester	English Composition I (3)	Mathematics for Business and Economics (3)		Introduction Speech Communications (3)		Personal Computer Hardware (3)
	13 2 <sup>nd</sup> Semester			Science Elective (3)		Computer Course (3) Introduction Database Programming Oracle (3)	Implementing Microsoft Windows Network (3) Unix Operating System I (3)
ACC: Associate of Applied Science (Tech Prep)	14 1 <sup>st</sup> Semester					Installing Administering Windows 2000 (3) Network Programming Elective (4)	Unix Operating II (3) Basic Router Configuration: Cisco 2 (3) Administration Novell NetWare (4)
	14 2 <sup>nd</sup> Semester	Humanities (3)			Social and Behavioral Science (3)	Network Security (3) Systems Analysis and Design (4)	Practicum CIS (3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis (). ACC credits are semester hours in parenthesis ().

**EXAMPLE: Career Cluster: Manufacturing/Construction with a Concentration in Building Construction/Technology (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Computer Applications (1)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Construction Methods Materials ACC\$ (4) Residential Light Commercial Blueprint Reading ACC\$ (3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Building Codes Inspections ACC\$ (3) Conventional Wall Systems ACC\$ (4)
Career Cluster Specialization	13 1 <sup>st</sup> Semester	Written Communications (3)	Mathematics (3)				Concrete Residential (4) Mechanical Plumbing Electrical Systems Construction (4)
Construction Management	13 2 <sup>nd</sup> Semester	Humanities (3)			Social and Behavioral Science (3)	Oral Communications (3)	OSHA Regulations- Construction Industry (4) Construction Mgr II (3)
ACC: Associate of Applied Science (Tech Prep)	14 1 <sup>st</sup> Semester					Building for Resource Conservation (4)	Construction Mgt III (3) Construction Estimating I (3) Construct. Estimat II (3) Project Scheduling (3)
	14 2 <sup>nd</sup> Semester					Conventional Exterior Finish Systems (3) Conventional Interior Finish Systems (3)	Computer-Aided Construction Scheduling (3) Cooperative Educ.- Construction (2)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis (). ACC credits are semester hours in parenthesis ().

**EXAMPLE: Career Cluster: Legal and Protective Services with a Concentration in Law and Criminal Justice Six-Year Pathway**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Emergency Communications (0.5)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Introduction to Criminal Justice ACC* (3) Crime in America ACC*(3)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Court Systems and Practices ACC* (3) Fundamentals of Criminal Law ACC* (3)
Career Cluster Specialization  Law Enforcement ACC: Associate of Applied Science  63 hours	13 1 <sup>st</sup> Semester	English Composition I (3)				Intro to Sociology (3) Intro to Psychology (3) Personal Computing (3)	
	13 2 <sup>nd</sup> Semester				Texas State and Local Government (3) U.S. History I (3)		Juvenile Justice System (3)
	14 1 <sup>st</sup> Semester		Mathematics (3)		U.S. History II (3) U.S. Government (3)		Ethics in Criminal Justice (3) Legal Aspects of Law Enforcement (3)
	14 2 <sup>nd</sup> Semester	Humanities/Fine arts (3)			Unrestricted Elective (3) Fundamentals Public Speaking (3)		Criminal Investigation (3) Police Systems and Practices (3)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

**EXAMPLE: Career Cluster: Engineering/Technical Services/Transportation with a Concentration in Automotive Repair (Six-Year Pathway)**  
**AISD Recommended Graduation Program (24 Credits/7-Period Day), Graduating with at least 6 Semester Hours of College Credit**

	Grade	English (4.0 Credits)	Mathematics (3.0 Credits)	Science (3.0 Credits)	Social Studies (3.5)/ Economics (0.5)/ Foreign Lang. (2.0)	PE/Health (2.0)/ Speech (0.5)/ Technology (1.0)/ Fine Arts (1.0)	Career Cluster (3.5 Credits)
Foundation AISD Recommended Graduation Program (24 Credits)	9	CP English I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Algebra I (1) <b>Option: 9<sup>th</sup>-Grade Catch-up Course (0)</b>	Biology (1) Option: Integrated Physics & Chemistry (1)	World Geography (1)	Health Education (0.5) Business Computer Info Sys I (1.0) Fine Arts (1.0)	Support and Career Exploration (0.5)
	10	CP English II (1)	Geometry (1)	Option: Biology (1)	World History Studies (1) Foreign Lang I (1)	Speech (0.5) PE/Health (1)	Introduction to Transportation Services (1)
Career Cluster Core	11	CP English III (1)	Algebra II (1)	Chemistry (1)	U.S. History-Since Reconstruction (1) Foreign Lang II (1)	PE/Health (0.5)	Intro to Automotive Technology ACC* (4) Automotive Electrical Systems ACC* (4)
	12	CP English IV (1) <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Pre-calculus <b>Option: 12<sup>th</sup>-Grade Catch-up Course (0)</b>	Physics (1)	U.S. Government/ Economics (0.5 each)		Automotive Engine Repair ACC* (4) Engine Performance Analysis I ACC* (4)
Career Cluster Specialization	13 1 <sup>st</sup> Semester	English Composition I (3)				Personal Computing (3)	Automatic Transmissions and Transaxles (4) Automotive Heating and Air Conditioning (4)
Automotive Technology	13 2 <sup>nd</sup> Semester		College Mathematics (3)			Intro Speech Communications (3)	Automotive Electronics (4) Engine Performance Analysis II (4)
ACC: Associate of Applied Science	14 1 <sup>st</sup> Semester				Social and Behavioral Science (3)		Automotive Brake Systems (4) Manual Drive Train and Axles (4)
63 hours (4 Semesters collapsed into 3)	14 2 <sup>nd</sup> Semester						Suspension and Steering (4) Internship Automotive Technician (4)

\* Courses proposed for dual credit; # Courses already approved for dual credit with ACC; + AP Courses; \$ Tech Prep Courses.  
Credits: AISD credits are Carnegie credits in parenthesis ( ). ACC credits are semester hours in parenthesis ( ).

## Example of an Institute

## Institute for Construction, Manufacturing and Engineering

An institute consists of at least four related academic and career/technical concentrations and would be designed to draw a mainstream group of at least 300 students, grades ten through 12.

This institute would prepare students for postsecondary studies and careers in one or more of these broad career fields:

**Manufacturing:** Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance and manufacturing/process engineering.

**Construction:** Designing, planning, managing, building, and maintaining physical structures and the larger building environment including roadways and bridges and industrial, commercial and residential facilities and buildings.

**Scientific Research, Engineering and Technical Services:** Planning, managing and providing scientific research and professional and technical services (e.g. physical science, social science, engineering) including laboratory and testing services, and research and development services.

**Transportation:** Planning, management, and movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services such as transportation infrastructure planning and management, logistics services, mobile equipment and facility maintenance.

The power of the institute is that content in all academic courses it offers is relevant to the theme of the institute. This means that students who pursue a concentration in building construction and technology would have opportunities from time to time to read and write about literature related to a construction theme in their English classes and to use mathematics often to solve real-world problems found in the construction industry. In their science classes, they might study the physical properties of various building materials, and in art appreciation, they might study designs of buildings. Students gain a better understanding of content and retain knowledge to a greater degree when they see the connection between what they are learning and real life. Integration of the institute's theme across its curriculum is one way to help students link their learning to the career.

Some career and technical courses are common to several areas of concentration in the cluster providing students flexibility in adjusting their career path while not losing ground in building knowledge and skills in the broad career field.

The two configurations for institutes in construction, manufacturing and engineering in the following tables show the commonality between two broad career clusters – Manufacturing/Construction and Engineering/Technical Services/Transportation. They illustrate why these clusters and their respective areas of concentration fit together well in the institute. Note the prevalence of drafting and blueprint reading across the two clusters and their concentrations. Also note that an academic concentration in mathematics and science is appropriate for either institute.

<p style="text-align: center;"><b>Institute I</b> <b>Construction, Manufacturing and Engineering</b></p>	<p style="text-align: center;"><b>Institute II</b> <b>Construction, Manufacturing and Engineering</b></p>
<p><b>Mathematics and Science Area of Concentration</b></p>	<p><b>Mathematics and Science Area of Concentration</b></p>
<p>Algebra I Geometry Algebra II Pre-Calculus AB AP Calculus AB AP Calculus BC AP Statistics Biology Chemistry (Honors) AB Integrated Physics/Chem Physics (Honors) AB AP Physics B AP Physics C</p>	<p>Algebra I Geometry Algebra II Pre-Calculus AB AP Calculus AB AP Calculus BC AP Statistics Biology Chemistry (Honors) AB Integrated Physics/Chem Physics (Honors) AB AP Physics B AP Physics C</p>
<p><b>Pre-Engineering</b></p>	<p><b>Quality Assurance</b></p>
<p>Introduction Engineering Technical Drafting Intermediate Computer-Aided Drafting Engineering Design and Development</p>	<p>Quality Assurance Quality Control Teaming Statistical Process Control Total Quality Management</p>
<p><b>Welding</b></p>	<p><b>Architectural Drafting and Design</b></p>
<p>Introduction to Welding Using Multiple Processes Introduction to Blueprint Reading for Welders Introduction to Layout and Fabrication Introduction to Oxy-Fuel Welding and Cutting Introduction to Shielded Metal Arc Welding Mathematics for Measurement</p>	<p>Technical Drafting Construction Methods and Materials Architectural Drafting-Residential Intermediate Computer-Aided Drafting Civil Drafting</p>
<p><b>Electronics</b></p>	<p><b>Drafting and Design</b></p>
<p>Electricity Principles DC Circuits AC Circuits Electronic Fabrication Digital Fundamentals Solid State Devices</p>	<p>Technical Drafting Intermediate Computer-Aided Drafting Blueprint Reading and Sketching Mechanical Drafting</p>
<p><b>Building Construction</b></p>	<p><b>Home and Commercial Repair</b></p>
<p>Construction Methods and Materials Residential and Light Commercial Blueprint Reading Building Codes and Inspections Conventional Wall Systems OHSА Regulations-Construction Industry</p>	<p>Electricity Principles A/C Control Principles Refrigeration Principles Residential Air Conditioning Gas and Electric Heating</p>