

Program Viability Executive Summary Engineering and Industrial Technology

The Engineering and Industrial Technology (EIT) department at Bakersfield College consists of the following programs: Architecture, Automotive Technology, Construction Technology, Electronics Technology, Engineering, Industrial Drawing/CAD, Manufacturing Technology, Welding Technology, and Woodworking Technology. An additional program, Water Treatment also is included in our program, and is taught entirely by adjunct instructors. The Industrial Technology/General program category refers to the INDT B10 course and INDT B27X courses. These courses are taught as POL by faculty in EIT program areas. Engineering meets the CTE and transfer core mission, while the remainder of our programs meets the CTE core mission. Our viability criteria are as follows:

Employment Outlook, Employment of BC Students

Program	Annual Openings ⁽¹⁾	Average Growth ⁽¹⁾	Average Hourly ⁽¹⁾	Employment ⁽²⁾
Architecture	11	+7.9%	\$35.93	83.33%
Automotive	46	+4.6%	\$20.79	81.48%
Construction	323	+7.5%	\$26.02	96.55%
Electronics	318	+3%	\$20.99	91.67%
Engineering	175	+19.8%	\$50.38	Not App
Ind. Dwg./CAD	50	+10%	\$29.46	92.11%
Manufacturing	156	+19.1%	\$26.10	77.78%
Water Treatment	12	+29%	\$30.84	100.00%
Welding	55	+6.9%	\$24.93	75.00%
Woodworking	55	+7.9	\$29.00	58.33%

Data sources: (1) California EDD, EMSI, or other – an average of hourly wage is provided for programs serving for multiple occupational codes, (2) VTEA Core Indicator Reports – Core #4

Program Success, Retention, Completion

Program	Success Rates		Retention Rates		Completion (2011-12)	
	BC	State	BC	State	JS Cert. ⁽¹⁾	Cert. Ach. ⁽²⁾
Architecture	66.8%	71.1	86.5%	85.8	9	
Automotive	75.0%	75.4	85.5%	90.2	55	5
Construction	58.9%	76.1	86.3%	89.1		
Electronics	72.1%	73.1	86.9%	86.0		14
Engineering	78.5%	73.0	87.7%	84.3	Not App	Not App
Ind. Dwg./CAD	76.0%	71.5	91.2%	85.5	25	
Ind. Tech/Gen.	78.7%	Not Avail	93.9%	Not Avail	Not App	Not App
Manufacturing	75.0%	75.9	76.8%	86.0	78	1
Water Treatment	52.5%	78.8	87.0%	90.2	Not App	Not App
Welding	78.4%	75.5	90.4%	88.5	51	5
Woodworking	80.5%	81.6	95.0%	91.2		2

Data sources: BC Course Book, CCCC Data Mart, CTE Office data. Data is from 2011-12 academic year.

(1) Job Skills Certificates – less than 18 units of coursework (2) Certificate of Achievement – well over 18 units of coursework

Enrollment Trends, Productivity, Costs

Program	Yearly FTES					Productivity	Costs
	2007-08	2008-09	2009-10	2010-11	2011-12	FTES/FTEF	Cost/FTES
Architecture	79.1	70.4	65.2	65.2	63.4	14.2	\$3,585
Automotive	131.5	139.8	127.9	133.0	122.6	10.9	\$3,296
Construction	10.6	8.7	12.8	11.8	11.5	11.5	\$4,499
Electronics	69.6	72.0	60.4	73.9	66.1	11.9	\$3,255
Engineering	32.6	52.9	52.3	49.7	50.7	14.5	\$3,231
Ind. Dwg./CAD	76.8	78.1	74.9	67.2	61.1	9.9	\$3,555
Ind. Tech/Gen.	10.0	13.6	10.7	13.7	13.0	16.2	\$3,531 ⁽¹⁾
Manufacturing	19.8	18.1	23.5	23.5	30.4	13.4	\$3,344
Water Treatment	13.7	16.0	16.7	17.9	17.2	21.5	\$1,236
Welding	105.5	118.5	83.2	79.9	82.0	11.1	\$3,346
Woodworking	18.2	22.5	21.6	16.5	15.4	9.6	\$6,852

Data sources: BC Course Book. Cost per FTES is from Department-corrected cost breakdown report, except for (1) which is from District-Provided data.

Transfer Model Curriculum

The Engineering TMC is being prepared for vetting along with the C-IDs for engineering courses.

Ability to meet outside agency standards

The Automotive Technology program is accredited by NATEF (National Automotive Technician's Education Foundation), which gives students a direct path to ASE certification of skills sets that are required for the industry. The courses offered within the program directly reflect not only local employment needs, but are also required to maintain NATEF accreditation.

For the Electronics Technology and Welding Technology programs, several industry organizations offer certifications available to our students, such as the AWS (American Welding Society), ETA (Electronic Technician's Association), and ISA (International Society for Automation) certifications.

Ability for students to complete their program of study

Many of the programs in EIT are inter-related for certificate and Associates degree requirements. Reduction or elimination of programs would seriously interfere with student's ability to complete their program of study. For example, Welding courses are used in specific Automotive and Manufacturing certificates and as electives for other EIT programs. Manufacturing courses overlap with Welding and are electives for programs such as Electronics. Many of the programs have coursework that is part of the Industrial Technology (General) AS degree. An Electronics course is required for one of the Manufacturing Technology AS degrees and an elective for the Automotive AS degree.

Reductions in engineering would impact other departments at Bakersfield College. For example, should engineering be eliminated as a program then the Math department would not have sufficient enrollment to offer the sophomore calculus sequence (Math B6b, Math B6c, Math B6d, Math B6e). In addition, Physics would not have sufficient enrollment to offer the sophomore calculus-based physics courses (Physics B4b and B4c) and chemistry would have severely reduced sections of Chem B1a.

Revenue, Offset of Costs, Grants, and Donations

The department receives substantial benefit from donations, grants, and in collecting materials fees for several programs, which are returned to the general fund. It is estimated that Welding collects over \$17,000 per year in materials fees, as one example. Examples of the grants and donations include: STEM grant, C6 grant, Chevron donations, VTEA funding, industry and professional organizations donations (Electronics - \$9,000 this year and Welding – over \$18,000 this year). In addition, industry donates tens of thousands of dollars of equipment to supplement our instructional goals. All these items either offset operating costs from the department budget, or reduce the need of GUI funds for equipment and technology.