

Career and Technical Education at Delaware Technical Community College: Are Program and Workforce Outcomes Equitable?

Part 2

Delaware Technical Community College

Strategic Data Project for Postsecondary CTE Capstone Report

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Alan Phillips, ECMCF Fellow

Executive Summary

As Delaware's only community college, Delaware Tech has placed responsiveness to the state's labor market as one of its highest priorities. This project addresses the issue of how to best measure the College's efficacy at being responsive to the labor market as well as whether students are accessing employment opportunities equitably. Delaware Tech's participation in the Achieving the Dream (ATD) Network has generated interest looking at equitable employment outcomes and in doing so with better data than what has been previously available from administering Graduate Employment Surveys to graduates around the time of their commencement. This project looks at UI wage data as an alternative to Delaware Tech's former emphasis on outgoing graduate surveys alone. An added benefit of analyzing of UI wage records was that it facilitated a continuation of the College's ATD work, bringing to light apparent inequities in wages earned by members of some subgroups. Following a methodology incorporated into a recent ATD study, each of the College's CTE programs were placed into one of three "Workforce Intensity" groups, depending on the average annual wages graduates could expect to earn entering Bureau of Labor Statistics (BLS) occupations crosslisted with the College's instructional programs. Low Workforce Intensity, Medium Workforce Intensity and High Workforce Intensity groupings refer to low, medium and high hourly wage levels that students could expect to earn following their graduation from CTE programs offered at Delaware Tech. Generally, graduates of the subgroups analyzed for this project completed High Workforce Intensity programs – or programs leading to the highest-paying jobs – about the 50% of the time, with variations among cohorts. However, some subgroups earned average hourly wages that were less than graduates belonging to majority groups. For instance, females who graduated from High Workforce Intensity programs graduates earned an average of 13% less than males who graduated from the same programs. Black and Hispanic graduates of High Workforce Intensity programs earned 11% and 9% less, respectively, than White and Other racial-ethnic groups. While it is encouraging to see most students who graduate completing medium and high workforce intensity programs, graduation rates have been very small throughout the period studied and wage disparities among subgroups appear to persist.

Background

The first campus of Delaware Technical Community College (Delaware Tech), opened in Sussex County, Delaware in 1967, under the slogan, "a job for every graduate; a graduate for every job." By 1974, three additional campuses opened – one in Central Delaware in Kent County and two in Northern Delaware in New Castle County. While Delaware Tech's mission has evolved and the College has added comprehensive programs to support both employment and transfer, the College still maintains a strong association with its original objective, to be a primary supplier of workers for Delaware's workforce. In 2008, the Office of Research and Analytics (ORA), formerly Institutional Research, introduced a survey instrument to provide its College Placement Officers (now Career Services Counselors) with a metric of job placement in fields related to graduates' programs of study. The survey instrument, now called the Graduate Employment Survey, while largely consistent over the years in scope and content, is fundamentally a student perception survey and the College has desired better data in order to determine how the state's labor market responds to graduates from Delaware Tech's degree, diploma and certificate programs.

The Career and Technical Education Workgroup at the Delaware Department of Education (DEDOE) informed Delaware Tech in recent years they had entered into a data-sharing agreement with the Delaware Department of Labor (DEDOL) that provided them access to Unemployment Insurance (UI) wage records. DEDOE began to match data on CTE Pathway participants with wage records in an effort to gauge the extent to which Pathways graduates participated in the labor market and the wage levels those graduates were able to attain. DEDOE assisted Delaware Tech in developing a new data sharing agreement that provided Delaware Tech with a mechanism by which they also obtain UI wage record data on Delaware public high school graduates who continued in CTE majors at the College.

This project represents Delaware Tech's initial implementation of the data sharing agreement and subsequent acquisition of UI wage record data on cohorts of CTE program graduates. This project describes the UI wage record data obtained from DEDOL and how the data was shaped and analyzed in order to draw conclusions about graduates experiences in the state's labor market, and specifically, the levels of wages that are available to program graduates. In addition, Delaware Tech is a current Achieving the Dream participant and is interested in addressing educational equity among gender and racial-ethnic subgroups who study and graduate from the College's program. The SDP Fellow's review of UI wage records also sought to shed light on issues of labor market outcomes among the College's major subgroups of graduates. This project describes the findings of this research.

Data Sources

The SDP Fellows at Delaware Tech submitted six cohorts of entering fall students to the DEDOE in order to match records with certain characteristics from the students' public high school experiences. In order to provide adequate time for student to enter programs of study at Delaware Tech and complete their programs within 200% of the normal time-to-completion, the following fall cohort windows were selected: Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017. The DEDOE characteristics sought for relevance to wage outcomes were: 1) participation in high school CTE Pathway courses, 2) CTE Pathway concentrator status, 3) CTE Pathway completer status, and 4) the number CTE courses in which students participated during their high school years. DEDOE (within the parameters of their data sharing agreement with DEDOL) submitted the same records to DEDOL to be matched with UI wage records and returned them to the SDP Fellows at Delaware Tech.

Some initial limitations were recognized in the UI wage record data, and these limitations shaped the scope of what we were able to observe about the students included in the cohort groups. The original intention was to derive a pre-program wage and post-program wage for cohort members in order to arrive at program-level wage benefits received by graduates. Since wage data was not available prior to the second quarter of 2016, a pre-program wage level was not available for most cohort members. In addition, small numbers of graduates at the program level made post-graduate wage level calculations impractical.

Analysis

The CTE programs represented in the cohort data were assigned a "workforce intensity level" in order to provide a needed context for post-graduate outcomes among subgroups. The 117 CTE programs represented in the data were assigned a workforce intensity level, based on the average hourly wages of cross-listed SOC occupations. The analysis that follows focuses primarily on subgroup enrollment and graduation from programs by workforce intensity and wage outcomes, observed by summarizing average hourly wages for cohorts of students who graduated from programs within 200% of the normal time-to-completion.

Programs cross-listed with occupations associated with average hourly wages of \$15.32 or less were assigned "low workforce intensity"; programs cross-listed with occupations associated with average hourly wages between \$15.33 and \$19.15 were assigned "medium workforce intensity"; and programs cross-listed with average hourly wages greater than \$19.15 were assigned "high workforce intensity".

Results

Table 1 below summarizes the cohort members, subgroups and graduates whose wage outcomes were analyzed for this report. “Graduate” (GRAD) refers to cohort members who completed their credentials (usually associate’s degrees) within 200% of the normal-time-to-completion. Some graduates of shorter diploma graduates were also included. The average rate of graduation was about 17%, across cohorts, within 200% of the normal-time-to-completion. Subgroup graduation rates were substantially less. Each subgroup included in this analysis is treated individually in the displays that follow, with respect to cohort membership, rate of graduation from programs classified as low, medium, and high workforce intensity and finally, average hourly earnings compared to majority members of fall cohorts.

Cohort Enrollment and Graduation

Table 1. Cohort Graduation Rates by Subgroup, Fall 2012 – Fall 2017

	Fall 2012			Fall 2013			Fall 2014			Fall 2015			Fall 2016			Fall 2017		
	ENR	GRAD		ENR	GRAD		ENR	GRAD		ENR	GRAD		ENR	GRAD		ENR	GRAD	
		#	%		#	%		#	%		#	%		#	%		#	%
Cohort	1368	232	17%	1457	243	17%	1417	242	17%	1434	266	18%	1703	316	19%	1544	248	16%
Female	481	85	6%	523	89	6%	506	75	5%	521	95	7%	628	114	7%	568	95	6%
Black	339	68	5%	394	68	5%	356	75	5%	367	62	4%	493	84	5%	409	42	3%
Hispanic	129	19	1%	145	25	2%	180	23	2%	177	28	2%	206	43	3%	239	36	2%
Pell	707	125	9%	736	117	8%	781	132	9%	769	136	9%	917	168	10%	853	134	9%
1st Gen	577	88	6%	612	108	7%	549	88	6%	519	99	7%	624	97	6%	569	79	5%

Graduates by Subgroup, Workforce Intensity and Wage Outcomes

Female students comprised 35% - 37% of the total enrollment of each fall cohort and graduated at an average rate of six percent (see Table 1). The largest number of female graduates was 114 from the Fall 2016 cohort; the smallest number was 85 from the Fall 2012 cohort. Across cohorts, an average of 46% of female graduates completed high workforce intensity programs, i.e. those that are linked with higher-paying occupations, as displayed in Figure 1 below. Larger numbers of females graduated from low workforce intensity programs from the Fall 2015, Fall 2016 and Fall 2017 cohorts, increasing from 13% in Fall 2014 to 22%, 24% and 23% of female graduates from the Fall 2015, Fall 2016 and Fall 2017 cohorts, respectively.

Table 2 displays average hourly wages of male and female graduates from low, medium and high workforce intensity programs. Females graduating from low workforce intensity programs 16% less than male graduates from low workforce intensity programs. The average hourly earnings of female graduates from medium workforce intensity programs was 19% less than males; and the average annual earnings of females from high workforce intensity programs was 13% less than males who graduated from high workforce intensity programs.

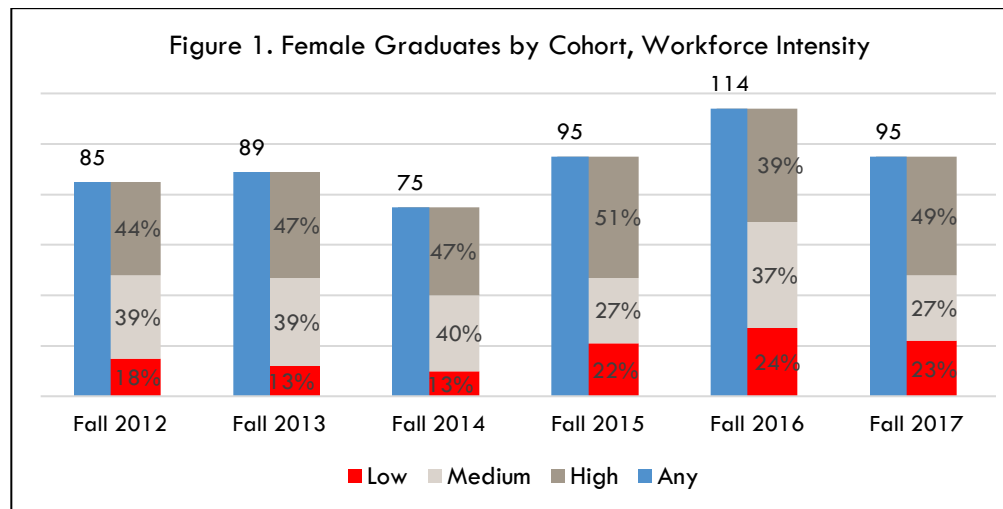


Table 2. Average Hourly Wages from UI Wage Analysis

Workforce Intensity of Program	Male	Female	Difference
Low	16.61	13.22	-16%
Medium	16.85	14.04	-19%
High	15.50	13.90	-13%

Black students represented an average of 26% of the total composition of fall cohorts and had an average graduation rate within 200% of the normal-time-to-credential of 5%. In Fall 2017, 60% of black graduates completed high workforce intensity programs, up from a range of 51% - 59% of graduates from the Fall 2012 – Fall 2016 cohorts. An average of 24% of black students completed medium workforce intensity programs across cohorts, and an average of 18% of black graduates completed medium workforce intensity programs.

Hispanic students represented a smaller, but growing segment of each fall cohort. Hispanics represented 9% of the Fall 2012 cohort and grew steadily over the six successive fall cohorts, finally representing 15% of the Fall 2017 cohort. Hispanic students graduated at smaller rates, however, than other cohorts represented in this analysis, averaging a 2% rate of graduation within the normal-time-to-credential across fall cohorts. Across cohorts, more than half of Hispanic graduates completed high workforce intensity programs; one-third completed medium workforce intensity programs, and an average of 13% of Hispanic graduates completed low workforce intensity programs.

Among graduates of low workforce intensity programs, black graduates made average hourly wages 14% less than white and students belonging to other racial/ethnic groups. Hispanic graduates made 11% more than graduates who belong to other racial/ethnic groups. Both black and Hispanic graduates from medium and high workforce intensity programs made less than white students and students belonging to other racial/ethnic groups. Black students who graduated from medium workforce intensity programs made 8% less; Hispanic students made 7% less. For high workforce intensity programs, black graduates made 11% less and Hispanics 9% less than graduates from high workforce intensity programs than graduates belonging to white or other racial/ethnic subgroups.

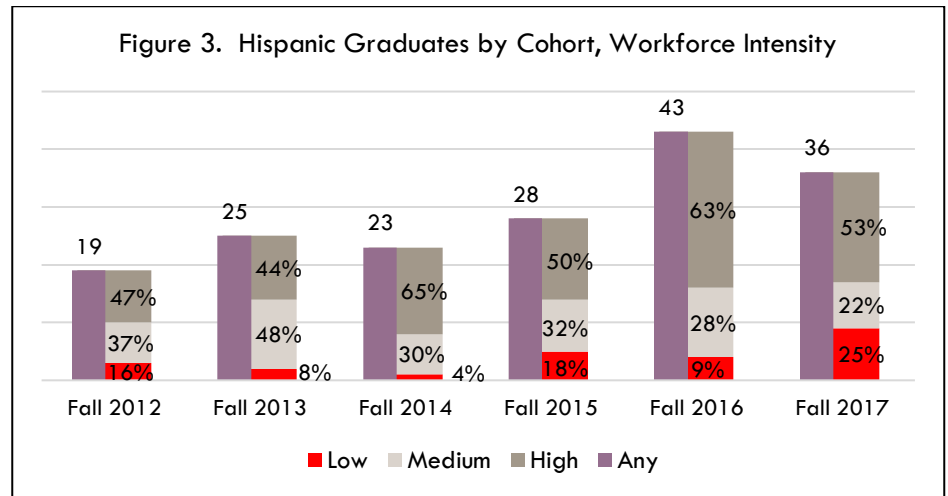
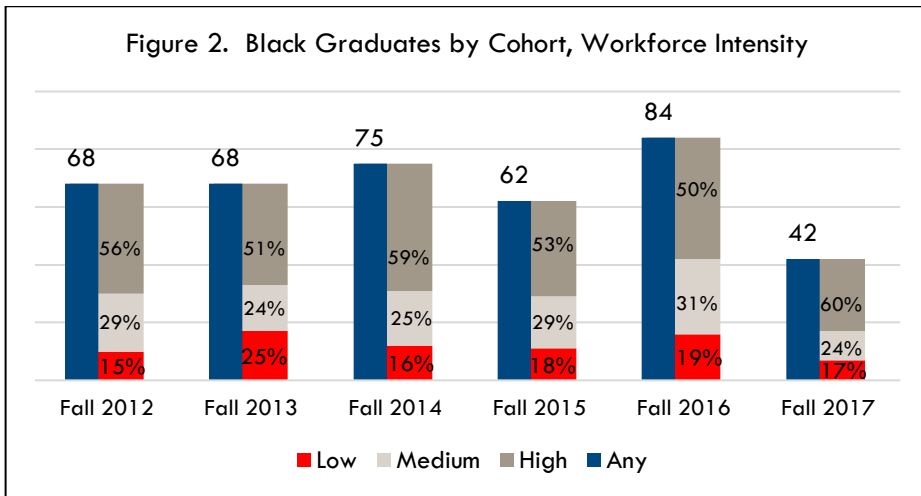


Table 3. Average Hourly Wages from UI Wage Analysis

Workforce Intensity of Program	White or Other	Black	Difference	Hispanic	Difference
Low	15.55	13.63	-14%	17.51	11%
Medium	15.36	14.22	-8%	14.34	-7%
High	15.62	14.13	-11%	14.30	-9%

Pell recipients averaged just over half (53%) of fall cohort members and graduated at an average rate of 9% within 200% of the normal-time-to-credential. About half of these students consistently graduated from high workforce intensity programs. Thirty percent (30%) of Pell recipient graduates completed medium workforce intensity programs and an average of 18% graduated from low workforce intensity programs.

Pell recipient graduates from low workforce intensity programs earned nearly the same average annual wage as Non-Pell recipients, with Pell recipients earning slightly (1%) more. Non-Pell graduates of medium and high workforce intensity programs earned average annual wages of 17% and 9% less, respectively, than Pell recipient graduates of medium and high workforce intensity programs.

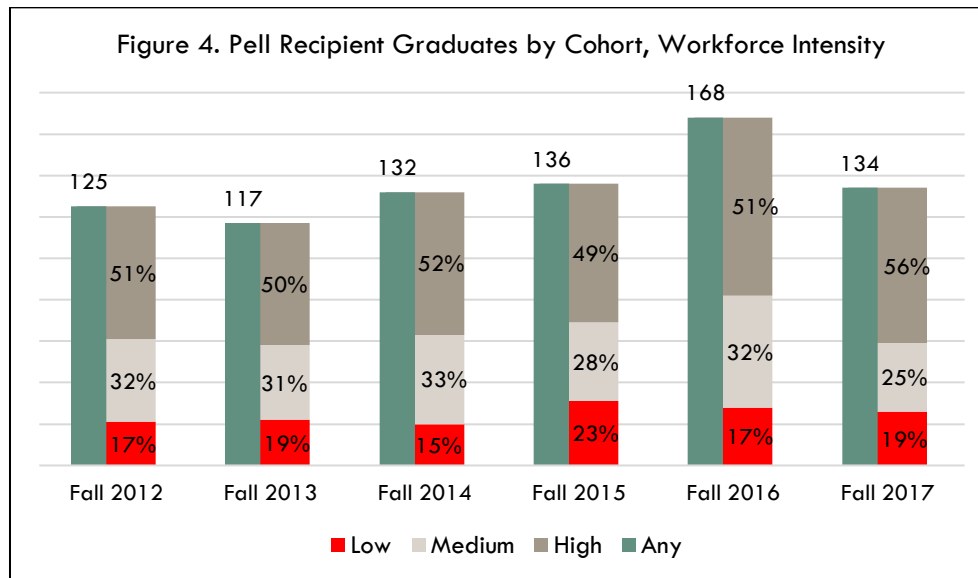


Table 4. Average Hourly Wages from UI Wage Analysis

Workforce Intensity of Program	Non-Pell	Pell	Difference
Low	15.36	15.56	1%
Medium	16.76	14.28	-17%
High	15.74	14.38	-9%

The number of 1st Generation members of each fall cohort declined steadily from 42% of the Fall 2012 and Fall 2013 cohorts and ending at 37% of the Fall 2017 cohort. These students graduated within 200% of the normal-time-to-credential at a rate of 6%, on average across cohorts. Fifty percent (50%) of 1st Generation students graduated from high workforce intensity programs; 39% graduated from medium workforce intensity programs; and an average of 16% of 1st Generation students graduated from low workforce intensity programs, across cohorts.

Average hourly wage disparities were less pronounced for the 1st Generation student subgroup, with 1st Generation graduates of low workforce intensity programs earning 3% more than their Non-1st Generation counterparts; and 1st Generation graduates of medium workforce intensity programs earning 4% more than Non-1st Generation students. However, within graduates of high workforce intensity programs, 1st Generation students earned 4% less than their Non-1st Generation counterparts who graduated from high workforce intensity programs.

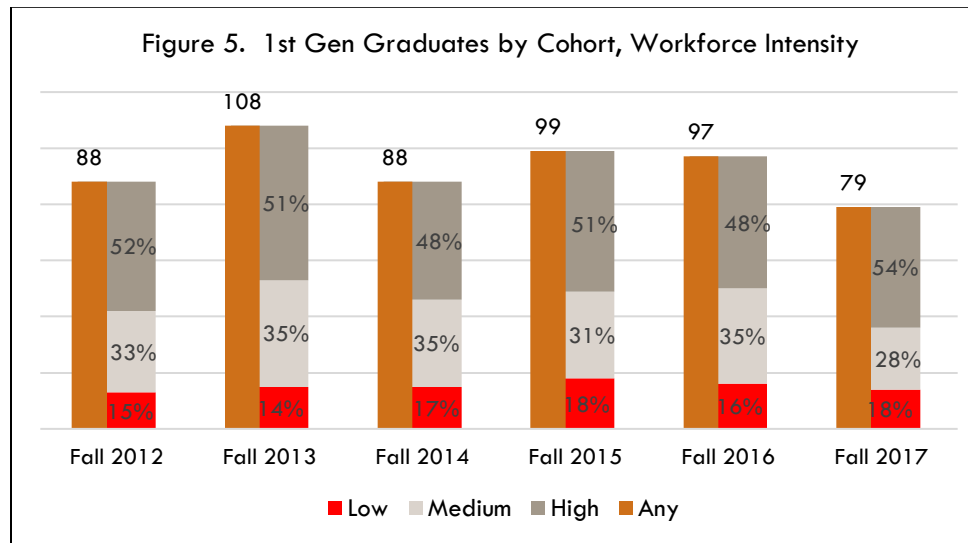


Table 5. Average Hourly Wages from UI Wage Analysis

Workforce Intensity of Program	Non-1 st Gen	1 st Gen	Difference
Low	15.32	15.75	3%
Medium	15.28	15.89	4%
High	15.27	14.62	-4%

Looking Forward

Delaware Tech Department Chairs have address graduate employability as part of their five-year program review cycle. In the past, this topic was covered largely by reviewing labor market information for occupations most closely aligned with academic programs and by reviewing the rates at which graduates reported employment in their fields on the annual Graduate Employment Survey. The Graduate Employment Survey was administered to every graduate at the time of commencement and a high level of coverage – 90% or more – was sought in order for the results to be comprehensive and representative of all of Delaware Tech’s programs. The last two Graduate Employment Surveys (2020, 2021) marked a procedural change, when they began to be administered several months following graduation. In addition, instead of trying to obtain a real response rate of 90%, a representative sample of graduates Collegewide has been pursued. This has resulted in uneven survey responses by program, resulting in a reduced reliance on the survey instrument as an authoritative measure of a program’s success in linking graduates with employment related to their majors. In order to bolster the reduced significance of the Graduate Employment Survey, the author suggests incorporation of UI wage data analysis into the five-year cycle of program review in the following ways:

1. Introduce Workforce Intensity groupings to the program review framework. This would generate discussion around where each program was classified and why. Delaware Tech Department Chairs may have evidence from their knowledge of local industry and/or advisory committees that warrants reconsideration of a program’s classification as Low, Medium, or High Workforce Intensive.
2. Access UI Wage data in groups of academic year graduates. Further UI Wage data extractions may be accessed in groups of Academic Year graduates to ensure larger groups of program graduates will be available to result in more robust program-level data. This will enable Department Chairs to more clearly see what average hourly wages their graduates are obtaining and whether/where wage disparities among subgroups of graduates exist.
3. Review the NAICS industry codes that are provided with Delaware’s UI wage data. NAICS industry codes can illuminate employment in different ways, depending on the academic program. For instance, for Culinary Arts graduates, NAICS codes can be instructive as to whether graduates appear to be working consistently in related within the 2-digit Hospitality and Tourism industry, under which food services industry classifications fall. Majors such as Information Technology, lead to employment across a variety of industries. Understanding which industries are employing these graduates would help Department Chairs understand which industries are receptive to hiring their graduates, and perhaps where work-based learning opportunities might be available for current students, in addition to wage levels graduates are obtaining.
4. Include disaggregated UI wage analysis in program review data and ask Department Chairs to respond. Seek insight, if needed, from program advisory committees and determine if academic preparation is an issue or if pre-career counseling and/or work-based learning opportunities can improve outcomes.

Finally, these findings will be shared with the Vice-President and Associate Vice-Presidents of Academic Affairs for consideration and incorporation into program review processes or ongoing standalone analysis of labor market outcomes of the College’s programs.

Appendix

Graduate Majors and Workforce Intensity Ratings			
Program Code	CTE Cluster	Description	Workforce Intensity
AHTAASPTA	Health Science	Physical Therapist Assistant	Low
AHTAASRCT	Health Science	Respiratory Care	Low
AHTAASVET	Health Science	Veterinary Technology	Low
BITAASBIT	Health Science	Biotechnology	Low
CETAASCET	Science,Tech	Civil Engineering Technology	Low
CETAASSET	Science,Tech	Surveying & Geomatics Engineering Technology	Low
COMAASCOM	Arts,A/VTech	Communications	Low
CULAASCUL	Hospitality, Tourism	Culinary Arts	Low
ENVAASEET	Science,Tech	Environmental Engineering Technology	Low
HSTAASDAC	Human Services	Drug/Alcohol Counseling	Low
AETAASAET	Archit	Architectural Engineering Technology	Medium
AGSAASBMT	Agr.,Food	Agri-Business Management	Medium
AGSAASLOH	Agr.,Food	Horticulture	Medium
AGSAASPAG	Agr.,Food	Production Agriculture	Medium
AGSAASTMT	Agr.,Food	Turf Management	Medium
AHTAASEXS	Health Science	Exercise Science	Medium
AHTAASMEA	Health Science	Medical Assistant	Medium
AHTAASMLT	Health Science	Medical Lab Technician	Medium
BSSAASACT	Bus Mangt	Accounting	Medium
CADAASCAD	Science,Tech	Computer Aided Design	Medium
CHMAASCEM	Health Science	Chemistry/Math Concentration	Medium
CHMAASCHM	Health Science	Chemistry/Math Concentration	Medium
CRJAASHDE	Law, Public Safety	Homeland Security and Emergency Management	Medium
DETAASDEM	Science,Tech	Design Engineering (Mechanical)	Medium
EENAASEEN	Science,Tech	Electronics Engineering Technology	Medium
EENAASETT	Science,Tech	Electronics Engineering Technology Transfer Option	Medium
EENAASINR	Science,Tech	Instrumentation Engineering Technology Option	Medium
ELMAASELM	Science,Tech	Electromechanical	Medium
FSYAASFSY	Agr.,Food	Food Science	Medium
HSTAASHST	Human Services	Human Service	Medium
METAASMET	Science,Tech	Mechanical Engineering Technology	Medium
AHTAASDHY	Health Science	Dental Hygiene	High
AHTAASDMO	Health Science	Diagnostic Medical Sonography Owens	High
AHTAASDMS	Health Science	Diagnostic Med Sonography	High
AHTAASNMT	Health Science	Nuclear Medicine	High
AHTAASOTA	Health Science	Occupational Therapy Assistant	High
AHTAASRAD	Health Science	Radiologic Technology	High



STRATEGIC DATA PROJECT

HIGHER EDUCATION

Graduate Majors and Workforce Intensity Ratings

AVIAASAVI	Transportation	Aviation Maintenance Technology	High
BITAASBIS	Health Science	Biological Sciences	High
BSSAASBAT	Bus Mangt	Business Administration Transfer Option	High
BSSAASGBT	Bus Mangt	General Business	High
BSSAASHMT	Hospitality, Tourism	Hospitality Management	High
BSSAASMKT	Marketing,Sales	Marketing	High
CMTAASCMT	Archit	Construction Management	High
CRJAASCRJ	Law, Public Safety	Criminal Justice	High
CRJAASLEO	Law, Public Safety	Law Enforcement Option	High
CSCAASCSC	Info Tech	Computing and Information Science	High
ECTAASECT	Science,Tech	Electrical and Computer Engineering Transfer	High
EENAASBID	Science,Tech	Biomedical	High
GISAASGIS	Science,Tech	Geographic Information Systems Technology	High
LOMAASLOM	Transportation	Logistics, Supply Chain, and Operations Management	High