STUDENT OUTCOMES COMMITTEE OF THE BOARD OF TRUSTEES

MINUTES
Thursday, September 4, 2014
1:30 p.m. – Room M2-34

Presiding: Stacy Holland

Present: Mr. Mark Edwards, Dr. Judith Gay, Dr. Donald Generals, Dr. Samuel Hirsch, Mr. Chad Lassiter, Dr. Judith Rényi, Ms. Jill Weitz (Executive Session only)

Guests: Dr. Mary Anne Celenza, Mr. John Moore

(1) Executive Session

There was a discussion about personnel issues and student issues.

(2) Public Session

a) Approval of Minutes of June 5, 2014 (Action Item)

The minutes were accepted.

b) Academic Program Audit - Engineering (Action Item)

Mr. Moore reviewed the Academic Program Audit of the Engineering Program. The program has potential for growth and faculty have made curricular changes over time; however there are a number of program issues including enrollment, retention and the failure to complete assessment of program learning outcomes. Board members discussed the enrollment issues. They agreed that the faculty need to aggressively work on an agreement with Drexel; work on an alternative senior year with a school like Carver; recruit heavily to diversify the enrollment. Board members also discussed the issues with assessment. Dr. Generals stated that the program faculty need to expand the scope of their assessment.

Dr. Celenza informed the Student Outcomes Committee members of the new student club for women, the Society for Women in Engineering.

Action: The Student Outcomes Committee of the Board agreed to recommend approving the audit with amendments to include a strategy to increase enrollment, explore K-12 partnerships, ensure seamless transfer to four-year institutions, and diversify the program. The Committee agreed to recommend requiring an update in one year.

(c) Academic Program Audit: Management of Computer Information Technology (Action Item)

Mr. Moore reviewed highlights of the audit of the Management of Computer Information Technology Program (MCIT). Students in the program perform well academically and there is growth potential based on the field; however, the program has multiple issues including: low enrollment; lack of leadership and support; failure to complete assessment of program learning outcomes; failure to complete a technology plan. Faculty in the division are discussing creating a certificate rather than having a degree. Students can transfer without an MCIT specific degree. Board members asked about the steps the College takes to accommodate students when a program is closed. Dr. Gay explained how the College works to ensure students are informed of the decision and have the best option developed for them.

Action: The Student Outcomes Committee of the Board agreed to recommend recommends that the Board of Trustees accept the audit with the amendment that the program be closed and the department work to create a certificate for students interested in management.

(d) Academic Program Audit: Middle States (Discussion)

Dr. Gay described the steps the College is taking to meet the requirements for the monitoring report required by the Middle States Commission on Higher Education by March 1, 2015. Steps the College has taken include: doing a triage of programs based on assessment progress with special meetings based on the triage; work with a consultant to develop an electronic repository for program assessment information; creation of a Curriculum Assessment Team (CAT) modeled after the College's successful Curriculum Facilitation Team; identification of faculty leadership for a Monitoring Report work group; increases in communication. The Student Outcomes Committee of the Board asked to have a presentation on program learning assessment at the Committee meetings. Dr. Generals suggested that the presentations be done by faculty members.

The meeting was adjourned.

Next Meeting:

The next meeting of the Student Outcomes Committee of the Board is scheduled for Thursday, October 2, 2014 at 1:30 p.m. in conference room M2-34.

Attachments:

Minutes of June 5, 2014
Academic Program Audit: Engineering
Academic program Audit: Management of Computer Information Technology

Summary of MCIT Audit

The Management of Computer Information Technology (MCIT) curriculum leads to an Associate in Arts degree. The primary goal of the program is to prepare students for transfer to a baccalaureate program in Computer Information Systems, Information Technology, and Business Administration with an emphasis on Management Information Systems or a related field. The curricular focus is a set of courses that develop business managers who understand and implement information management methods that are joined with automation to support business decision-making. The curriculum emphasizes the use of technology to manage information and business processes. Upon receiving the associate's degree, students are prepared to obtain employment as computer support specialists at an entry-level position. Further education is recommended for students who wish to advance to higher-level or supervisory positions.

Positions for Managers of Information Technology, who function as translators between programmers or engineers and administrators or higher level business managers, are part of a growing field of specialists. As they sit between technicians and management, they need to cultivate a vocabulary in both fields—a successful program requires input and guidance from faculty in two departments, computer science and business. This important characteristic was reflected in the program at its inception. It was designed modularly; all courses were borrowed from the already existing programs of Marketing/Management, Accounting, and Computer Information Technology. This mitigated the need for specific course development. The degree is based on 10 courses: five each from Business (accounting and management) and CIS. Students must also complete 2 additional elective courses based on their particular career or transfer interests.

The program has seen moderate growth since its inception in 2009, although the numbers are still small (from 14 to 47), and its students perform well academically. The program struggles, however, with leadership and support; it has failed to complete program audits as well as program management and technology plans. The program has also not pursued transfer agreements. Because the field generally requires a Bachelor's degree for entry. This makes transfer opportunities vital for the success of the program. Although there are local institutions to which students could transfer, only one articulation agreement exists (Peirce College). The program currently has little support from its constituent departments and a lack of strong leadership. QVIs indicate low scores on both quality and viability. Students are performing above their peers in the division but are stuck in the back half of the program, and graduations are not keeping pace with program growth.

For these reasons it is recommended that the program be closed as of Fall 2015.

Timeline: Fall 2014: begin process of program closure, current students contacted. Spring 2015: catalog changed to reflect closure. Fall 2014: No new students admitted. Spring 2018: final students graduated.

At the Student Outcomes Committee of the Board, the following additional outcome was added: The Division of Business and Technology create a business or supervision certificate (in part to provide education to computer science students interested in moving into management positions). Timeline: Certificate created by Fall 2015.

Summary of Engineering Science Audit

The Engineering Science Program at CCP prepares students who wish to complete a BS in a number of engineering fields for transfer. It is the fifth largest program in the MSHC division and has experienced little growth in the past five years. Students who enter into this select program perform well, overall. However, just over half leave the program before the second year. Once there, students seem to accumulate a large number of credits before graduating (averaging 20 more than they need to matriculate). As a transfer-oriented program, the faculty must ensure that the opportunities presented to students (from lab work and experience on equipment to internship options) are up to date and consistent with the desires of transfer institutions. While the program has completed course learning outcomes on schedule, there is a need to complete program learning outcomes. The faculty, in the past, have demonstrated an ability to use feedback to make changes to the program's curriculum and needs to build upon these past success to ensure the continued viability of the degree. Currently, however, there is only a single faculty member who teaches all engineering courses. Engineering, as a field has strong growth potential and a strong, low cost preparatory program like CCP's can be an important path to success for students.

Students in the program are more likely to be in Good Standing, Return to the Same Program, and Graduate than students in the Division or the College. Students are also more likely to depart either graduated or with long term success and to hive higher GPAs. The number of degrees awarded is small (15 in 2013), and is in the middle of a three year downward trend (from a high of 28 in 2011). However, the Fall to Fall retention for the program could be increased (e.g. Fall to Fall data for 2012 = 57.3%) and would result in increasing the number of graduates. Students in Engineering are also attempting (110) and completing (86) a larger number of credits than their peers in the Division (88 & 70) and the College (85 & 68).

Recommendations were as follows:

1. Complete Program Learning Outcome Assessments. At least one Program Learning Outcome should be assessed, analyzed, discussed, and disseminated during the Fall 2014 semester. All Program Learning Outcomes must be likewise completed by the end of the Spring 2015 semester. Program Learning Outcome and Course Learning Outcome assessment results should be discussed at a Department meeting and during the Spring 2015 Advisory Committee Meeting.

2. Refine assessment for Course Learning Outcomes and analyzed and communicate results to internal and external constituencies during the Fall 2014 and Spring 2015 semesters. Although course outcomes have been completed for many courses, the results are not clearly documented in an immediately accessible way.

3. Cultivate Articulation Agreements. Review the Engineering Science Curriculum in light of any curricular or pedagogical changes that are occurring at regional transfer program institutions in order to be sure that course content information is up-to-date. A report on the findings and any resulting action plans is due by Summer 2015. Develop a Program to Program Articulation

agreement with Drexel University by Fall 2015.

4. Two issues exist in the context of program management: 1) students are leaving the program early (for transfer) and not progressing to the second year; and 2) students that do progress to second year are accumulating a large number of credits before graduating. The program needs to investigate and document the reasons for both of these issues.
5. The program needs to determine ways in which it can stay current with the field of engineering—both in terms of transfer and employment—ensuring that opportunities for student learning are adequate and aligned with the future of the field. To accomplish this, the program needs to inventory laboratory equipment and procedures, internships and/or externships possibilities, increasing diversity within the field, and opportunities for research experiences. These should be compared to requirements and best practices at transfer institutions and within the field of engineering pedagogy. This should begin with discussions at the Spring 2015 Advisory Committee and a report of the findings presented to the Dean by Fall 2015. The findings should include an assessment of the future of the field and how CCPs program fits into that future.

At the Student Outcomes Committee of the Board, the following additional recommendations were added:

Given the economic potential for students who become engineers, this program is one that should be targeted for enrollment increases. It is particularly important, given the College's population, to increase the racial and gender diversity of the department. There are also opportunities for growth that exist through partnerships with both High Schools and Transfer Partners.

1. The program should develop a plan for increasing both enrollment and diversity in the program. The plan should be presented to the Board by the end of Fall 2015.

2. The program should cultivate pipelines with high schools (such as alternative senior year) and local four year institutions (Drexel and Temple) to both increase the number of students in the program and ensure opportunities for seamless transfer. A progress report should be delivered the Board by the end of Fall 2015.

STUDENT OUTCOMES COMMITTEE OF THE BOARD OF TRUSTEES

MINUTES
Thursday, June 5, 2014
1:30 p.m. – M2-34

Presiding: Ms. Stacy Holland

Present: Mr. Mark Edwards, Dr. Judith Gay, Dr. Samuel Hirsch, Dr. Sharon Thompson, Dr. Judith Renyi

Guests: Ms. Deirdre Garrity-Benjamin, Mr. John Moore, Ms. Marge Niven

(1) Executive Session

Updates were provided on the Physical Therapist Assistant Program, Achieving the Dream site visit, and the Middle States Accreditation visit and follow up.

(2) Public Session

(a) Approval of Minutes of May 1, 2014

The minutes were accepted unanimously.

(b) Geographic Information Systems (GIS) Program Audit

Mr. Moore presented the audit of the GIS program which includes the A.A.S. degree, the Academic Certificate and a Proficiency Certificate. When the GIS program was conceived, it was early on in the development of the field. The program was designed with a degree program and an Academic Certificate. The Proficiency Certificate was developed later to meet the needs of working professionals and others who wanted to add the GIS skill set to an already existing degree. Over the years it has become clear that this is where the demand for the Program is. The program director will then be able to market the certificate, work with the City and other non-profit organizations. If a student wanted to continue into a degree program, they can do so in Liberal Arts. Ms. Garrity-Benjamin described the work of the GIS club which has become the GIS professionals group. She distributed sample maps done for non-profit organizations. The Committee suggested other organizations the group could work with. The recommendation of the audit is to close both the degree program and Academic Certificate and to look at options for refining the Proficiency Certificate.

Action: The Student Outcomes Committee recommends that the Board of Trustees accept the audit as presented and recommend eliminating the A.A.S. degree and Academic Certificate in Geographic Information Systems.

(c) Institutional Research Benchmark Data

The College is part of a national community college benchmark project.
The summary data presented shows how we compare nationally and to our peers. The committee reviewed the tables on completion, persistence, and developmental completion success rates. Also considered was the summary of strengths and opportunities for improvement. The committee highlighted the need to continue to implement innovative strategies in both English and Math and to improve student success without lowering standards. The information on this report will be used to inform our dashboard and set goals.

The meeting was adjourned at 2:45 p.m.

(3) Next Meeting

The next meeting of the Student Outcomes Committee of the Board is scheduled for September 4, 2014 at 1:30 p.m. in conference room M2-34.

Attachments:

Minutes of May 1, 2014
Geographic Information Systems (GIS) Program Audit
National Community College Benchmark Study Summary
Achieving the Dream Site Visit Report

Community College of Philadelphia

Academic Program Audit: MCIT

Authors: John V
Moore III
Edward Baker

Date: August 2014

I. Executive Summary

The Management of Computer Information Technology program prepares students to start a path to become members of a growing field. Managers of Information Technology function as translators between programmers or engineers and administrators or higher level business managers; they need to cultivate a vocabulary in both fields.

The program has seen moderate growth since its inception in 2009, although the numbers are still small (from 14 to 47), and its students perform well academically. The program struggles, however, with leadership and support; it has failed to complete program audits and technology plans. The field generally requires a Bachelors degree for entry. This makes transfer opportunities vital for the success of the program. Although there are local institutions to which students could transfer, only one articulation agreement exists (Peirce College).

For the program to remain, it must find dedicated leadership to bring the program into compliance and to ensure its continued viability.

II. Program

The Management of Computer Information Technology curriculum leads to an Associate in Arts (A.A.) degree. The primary goal of the program is to prepare students for transfer to a baccalaureate program in Computer Information Systems, Information Technology, and Business Administration with an emphasis on Management Information Systems or a related field. The curricular focus is a set of courses that develop business managers who understand and implement information management methods that are joined with automation to support business decision-making. The curriculum emphasizes the use of technology to manage information and business processes. Upon receiving the associate's degree, students are prepared to obtain employment as computer support specialists at an entry-level position. Further education is recommended for students who wish to advance to higher-level or supervisory positions.

A. Brief History of the Program

The Management of Computer Information Systems Program was started in 2009. The goal of the program was, as it is now, to develop a set of skills that help address the growing need of business and organizations for technology savvy managers. Upon completion of the program, graduates will have an understanding of the practical application of technology to support organizational need for value added efficiencies in process and workflow structure. This knowledge will allow the students to successfully transfer to a four year institution where they can continue to specialize their education in the

fields of Management Information Systems and/or Business. At the same time the graduate is qualified to enter the job market as an entry level technology support specialist.

One notable characteristic of the program at its inception was its modular design. In this first stage of the program's development all courses were borrowed from the already existing programs of Marketing/Management, Accounting, and Computer Information Technology. This mitigated the need for specific course development. The degree is based on 10 courses: five each from Business (accounting and management) and CIS. Students must also complete 2 additional elective courses based on their particular career or transfer interests.

B. Curriculum Sequence

Course Number and Name	Pre- or Corequisites	Credits	Gen Ed Req.
First Semester			
CIS 103 – Applied Computer Technology		3	Tech Comp
ACCT 101 – Financial Accounting		4	
Math Elective – MATH 118 or above		3	Mathematics
ENGL 101 – English Composition I		3	ENGL 101
MNGT 121 – Introduction to Business[1]		3	
Second Semester			
CIS 105 – Computer Systems Maintenance		4	
ACCT102 – Managerial Accounting	ACCT 101 ("C" or better)	3	
ENGL 102 – The Research Paper	ENGL 101 ("C" or better)	3	ENGL 102, Info Lit
Science Elective[3]		3-4	Natural Science
CIS 106 – Introduction to Computer Programming		4	
Third Semester			
CIS 150 - Network Technology		4	
MNGT 141 – Principles of Management[1]	MNGT 121	3	
CIS 205 – Database Management Systems	CIS 103	4	
Social Science Elective[3]		3	Social Sciences
Humanities Elective[3]		3	Humanities
Fourth Semester			
CIS 270 – Systems Analysis and Design	CIS 205	4	
ECON 181 – Macroeconomics -or- ECON 182 - (Microeconomics)		3	
Directive Elective[2]		3	
Directive Elective[2]		3	

Minimum Credits Needed to Graduate: 63[3]

[1] This course may transfer as a general elective depending on the transfer institution.

[2] Directed electives are to be chosen from the CIS course offerings above CIS 105.

[3] All General Education requirements are met through required courses except for the Writing Intensive, Interpretive Studies, and American/Global Diversity requirements.

C. Curriculum Map

	Program Student Learning Outcomes				
Courses	Use technology effectively to communicate and analyze information related to computer information systems and business management processes.	Work as part of a professional team to analyze, design and implement computer information systems for business analysis.	Demonstrate a broad knowledge of computer information systems terminology and practices, including those related to networking and data communications technology.	Explain basic principles of project management	Demonstrate a fundamental knowledge of business activities and the role of data and information technology in these activities.
CIS 103: Applied Computer Technology	I	I	I		
ACCT 101: Financial Accounting	I	I			I
MNGT 121: Intro to Business	I R	I	I R	I	I
CIS 105: Operating Systems	I R	R	I R		
ACCT 102: Managerial Accounting	R	R			R
CIS 106: Into to Programming	R	R A M	R	R	
CIS 150: Data Communication		R	I A M	R	
MNGT 141: Prin. of Management	R A M	R		I	R
CIS 205: DataBase Management Systems	I R	R	R A M	I R	
CIS 270: Systems Analysis and Design		I	R A M	I R A M	R A M
ECON: 181 or 182	R	R			

I=Introduced; R=Reinforced ; M=Mastered; A=Assessed

D. Future directions in the field/program

According to the Occupational Outlook Handbook, Management of Information Systems and Technology is expected to grow 15% faster than other fields between 2012 and 2022. This growth will be fueled by the need to manage employees in wireless systems, cyber security, and software integration and software as a service.

The web will play a major role in the delivery of software systems through both application hosting and Cloud based systems. A large number of jobs are expected to be created in Healthcare, which is expected to have a 42% increase in information systems integration over the next decade. Increases in Cloud computing will shift some attention from in-house services at non-computing industries (such as finance and education) to firms involved and specialized in computer systems design and its related services. This shift will be due to an expected increase in outsourcing of jobs and a strong shift from in house IT-departments to cloud computing companies. In response to this, faculty have begun infusing existing courses with information about Project Management and Responsive Design Concepts and Standards—as was done in the most recent updates with CIS 270 and CIS 130.

III. Profile of Faculty

Initially, there was only one member of the CT department working on the further development of the MCIT and its offerings. All other faculty affiliated with the MCIT program reside in the programs that comprise the twin cores of MCIT: Information Technology and Business Administration. The program itself is housed in the Computer Technologies Department. The current program coordinator has indicated that he is no longer interested in serving in that role.

A. Program Faculty

Faculty Member	Position	Courses Taught
Edward Baker MA, Rosemont College	Associate Professor Program Coordinator	CIS 140, 230, 231

B. Level of Engagement of Program Affiliated Faculty

The program affiliated faculty have participated in many college-wide initiatives, including various hiring committees, curriculum development committees, and enrollment management teams. The Faculty participate in the Faculty Council on Education, the International Webmasters Association (IWA), and have served as Faculty mentors of student clubs. Although many of these activities are done under the auspices of other programs in the Computer Technologies department.

IV. Student Profile

The MCIT program has grown from an inaugural class of 14 to a current population of 47—while still relatively small, this represents growth of over 200 percent. The program has a smaller percentage of females (40%) and African-Americans (40%) than the College (64% and 48%, respectively). Students are also older (49% over 30 as compared to 30%).

Table 1. Headcounts

		Fall 2009	Fall 2010	Fall 2011	Fall 2012	Fall 2013	5 Year Average	5 Year Change
MCIT	Headcount	14	23	36	38	47	27.3	236%
	FTE Headcount	11	18	25	27	37	20.5	236%
Business & Technology	Headcount	3,073	3,167	3,246	3,160	3,286	3118.3	7%
	FTE Headcount	2,288	2,358	2,372	2,324	2,378	2292.7	4%
College	Headcount	19,047	19,502	19,752	18,951	19,263	18973.7	1%
	FTE Headcount	13,360	13,697	13,681	13,112	13,106	13139.8	-2%

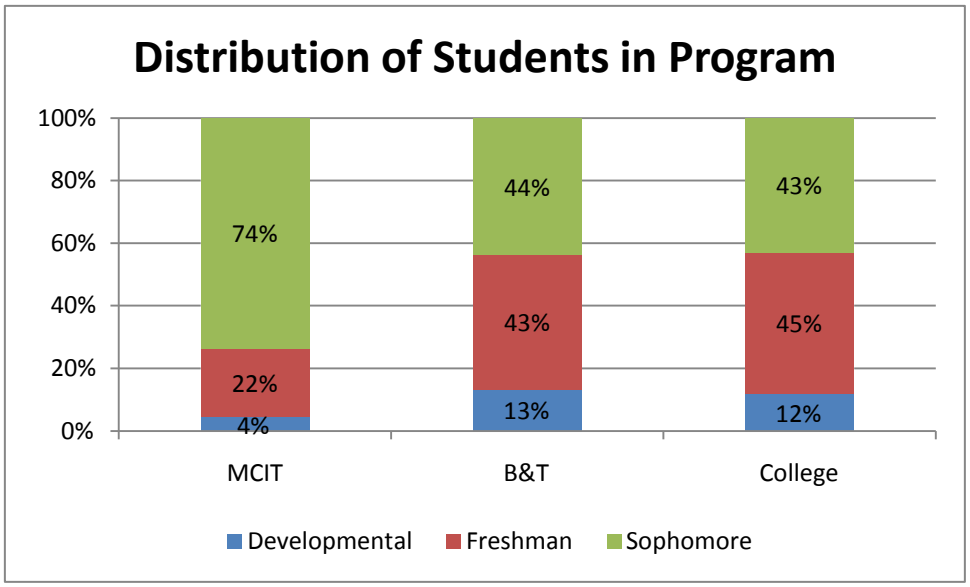
Table 2. Demographics

Demographics: Running 5 Year Average

	MCIT	Business and Technology	College
Female	40.2%	45.8%	64.0%
Male	59.8%	53.9%	35.6%
Unknown	0.0%	0.3%	0.4%
Native American	0.6%	0.5%	0.5%
Asian	12.8%	10.6%	7.2%
African American	39.5%	48.2%	48.6%
Latino/a	4.6%	5.3%	5.4%
White	25.9%	21.3%	24.9%
Other	3.9%	3.9%	3.4%
Unknown	12.7%	10.2%	9.9%
16 – 21	13.2%	35.2%	32.5%
22 – 29	35.2%	38.4%	36.6%
30 – 39	25.8%	14.6%	17.0%
40 +	23.4%	11.1%	13.0%
Unknown	2.4%	0.9%	0.9%
Full Time	34.5%	37.6%	31.2%
Part Time	65.5%	62.4%	68.8%
All Developmental[1]	29.2%	30.9%	28.3%
Some Developmental	45.8%	50.0%	43.9%
College Level	25.0%	19.0%	27.8%

[1] Status at College entry as determined by placement testing.

Figure 1: Student Distribution Pattern



B. Student Outcomes

Students in the program generally have slightly higher outcomes across the board: standing, retention, graduation, course completion, and GPA are all higher than the College's average. Students, however, are less likely to transfer upon graduation, and do not progress through the program. They average a year and a half longer to graduate and have a much larger percentage of students in the sophomore year of their program than the College; degrees are small for the program size. Faculty indicated this may be due to a larger number of students internally transferring into the program from either business or computer science programs—entering later in their academic careers when a number of credits have already been accumulated.

Table 3. Outcomes Data: 5 Year Averages

		MCIT	B&T	College
Standing	Good Standing	89.8%	82.3%	85.0%
	Probation	8.3%	15.7%	13.5%
	Dropped	1.8%	2.0%	1.6%
Fall-Spring Retention	Returned/Same	70.5%	64.8%	65.8%
	Returned/Different	12.0%	6.1%	5.2%
	Graduated	6.5%	3.0%	2.1%
	Did Not Return	18.4%	26.2%	26.9%
Fall-Fall Retention	Returned/Same	44.8%	37.0%	36.7%
	Returned/Different	11.4%	8.6%	8.6%
	Graduated	16.3%	9.4%	8.4%
	Did Not Return	33.1%	45.0%	46.4%
Success at Departure[2]	Graduated	16.9%	13.4%	10.0%
	Long Term Success	41.9%	34.4%	36.2%
	Short Term Success	19.9%	13.3%	17.2%
	Unsuccessful	21.2%	38.8%	36.6%
Course Outcomes	Course Completion	93.2%	86.4%	88.2%
	GPA	3.02	2.56	2.65

[2] "Graduated" are students who earned certificates or associates degrees at the College. "Long term success" is defined as departure with a GPA of 2.0 or greater and 12 or more cumulative credit hours earned. "Short term success" is defined as departure with a GPA of 2.0 or greater and 11 or fewer cumulative credit hours earned. The "unsuccessful" departure group includes all departing students not otherwise classified including students who never complete a college-level course.

Table 4: Degrees Awarded

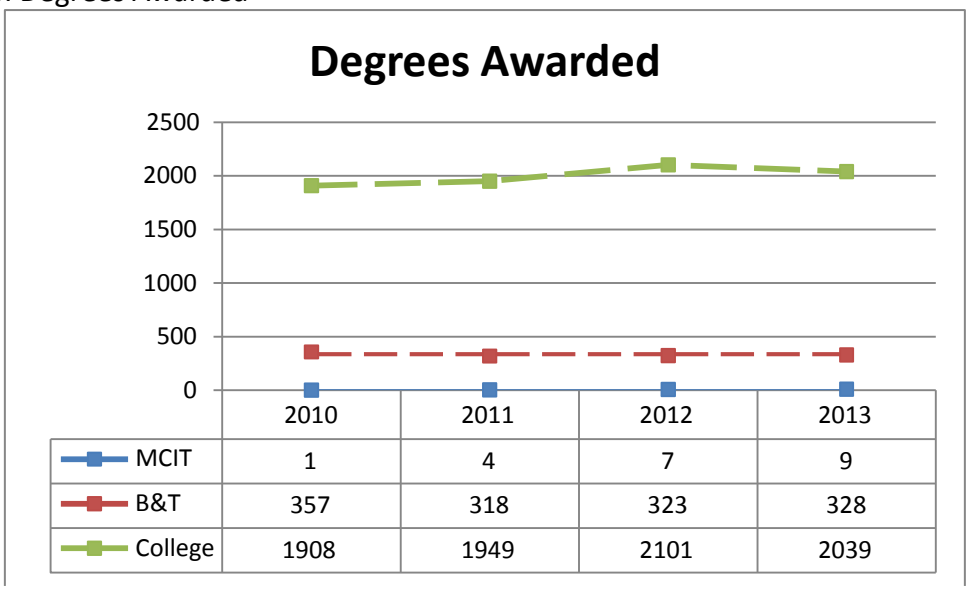


Figure 2: Percent Change in Degrees Awarded

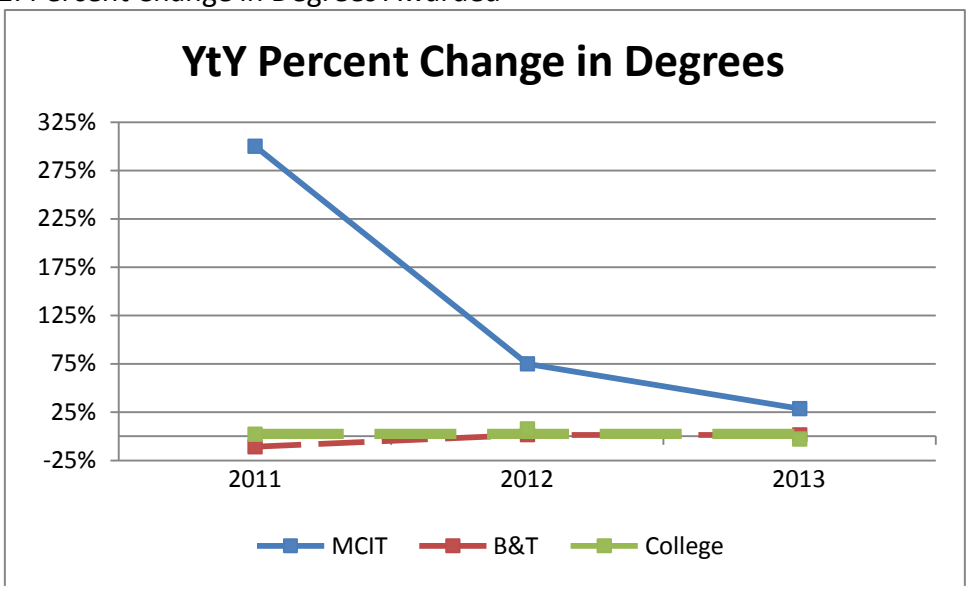


Figure 3: Time to Degree[3]

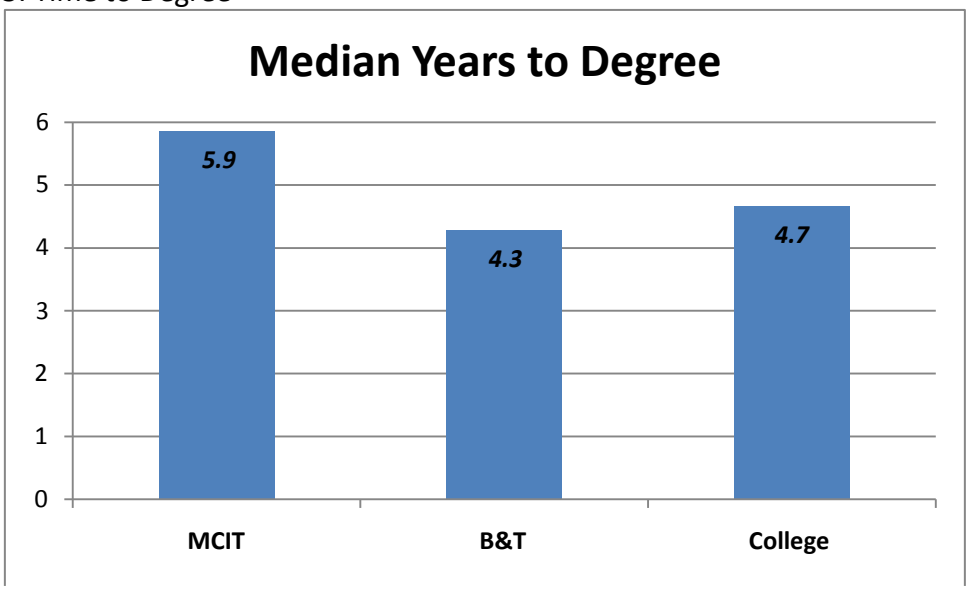
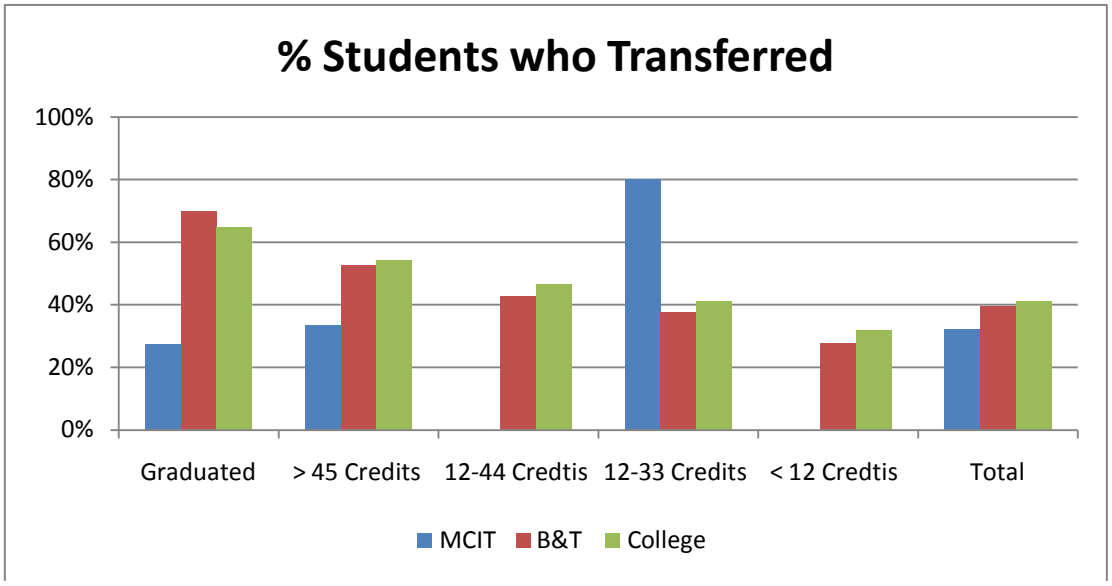


Figure 4. Transfer by Departure Status[4]



[3] Students with no prior enrollment in U.S. higher education who graduated in academic year 2012-2013 with only one Associate's degree.

[4] Fall 2005- Fall 2010 Cohorts

C. Student Feedback

There have been no formal Student surveys conducted over the last five years. Informal information gathering sessions have been conducted to gauge how students respond to the content of the current degree offering. According to Professor Ed Baker, one of the most common pieces of feedback students have is that they are not being informed that the degree is available. Many students only learn of the degree after being directed into other areas such as Culture Science and Technology or by taking elective courses in CIS such as Web design. Students who have completed courses in accounting, management, or CIS have indicated that they were directed towards CIS if they were not sure about transfer or Liberal Studies if transfer was their goal. Within the program, students have also expressed a desire for more web content, as well as e-commerce and electronic resource planning. There was a strong desire to learn about search engine optimization (SEO) and content management systems. They felt that these areas would be more relevant in the business world (as opposed to hardware repair).

There were too few graduates to calculate meaningful data from the College's alumni survey.

V. Learning Outcomes and Assessment

A. Program Level Outcomes:

Upon completion of this program graduates will be able to:

Use technology effectively to communicate and analyze information related to computer information systems and business management processes.

Design and implement computer information systems for business analysis.

Demonstrated a broad knowledge of computer information systems terminology and practices, including those related to networking and data communications technology.

Explain basic principles of project management.

Demonstrate a fundamental knowledge of business activities and the role of data and information technology in these activities.

B. Assessment of Student Learning Outcomes

An Assessment Plan has been developed for the program, however, as of the writing of this audit, no program outcomes have been evaluated.

As the courses from this program come from other departments, there are no specific MCIT courses and, therefore, no course learning outcomes. (Although to meet program learning outcomes MCIT affiliated faculty may want to use ppropriate data from required courses.)

C. Advisory Committee

The MCIT program shares an active Advisory Committee (AC) with the CIS and CS programs. It is comprised of faculty from local institutions, individuals from a variety of industries, as well as current and former students. Recent discussions have focused on the possibilities of additional program certificates, local employment needs, transfer possibilities, skill sets needed for employment and transfer, modernization of the curriculum, advising, and the general focus of the program.

Many employers on the Committee require at least a bachelor's degree for their developers and managers (meaning transfer is important). They also stressed the need for out of classroom experiences (internships, clubs, work) for candidates. There was ambivalence about certification exams, individuals indicated that while they may help in specific instances, they were often not required for employment. They noted the divergence between management and programmers/engineers in hiring. They also noted that customer service/help desk jobs are on the list of regional HPOs and are jobs available with only an Associate's degree.

In terms of courses, the committee mentioned the need for skills in Cloud Computing, Application Development, Web API, and Data Integrity. They also indicated the need to keep SLOs updated with current technology but to avoid the impulse to chase tech trends with brand new courses. They did note that there is no capstone for MCIT to pull ideas together.

D. Quality/Viability Indicators

In the past two years MCIT has scored low both in terms of quality (averaging 1.3 out of 4) and viability (1.6 out of 4) on QVIs, the program was warned about lack of program SLO assessment, low graduation rates, and time to degree for students.

E. Program Management

The program is growing with minimal effort by the affiliated faculty. There are some concerns that students may not be aware of the program and that advising in the business and computer science classes might ameliorate that. The program's management plan is attached (Appendix A). As noted above, moving students through to graduation is a challenge yet to be effectively addressed.

VI. Resources

The MCIT program faculty has reviewed technological needs for future courses. Several courses utilize course related program software that students need for course work including Microsoft Visio, Microsoft Project, MySQL Server and the Java Runtime. Courses using these and other packages need access to computer classrooms.

Instructors also like to use the computer classrooms for course lab projects and testing. The standard modern personal computer system is generally sufficient to run the software used in MCIT Computer and Business courses.

This review, it should be noted is an informal one and the MCIT program has not submitted their formal technology plan. (As required by Business and Technology programs with substantial technology (hardware or software) needs.)

VII. Demand

Many of the jobs associated with this field have growth potential higher than the average for all jobs (Table 7). The Management Information Systems title itself is expected to grow by 15%, slightly faster than all jobs (12%) between 2012 and 2022.

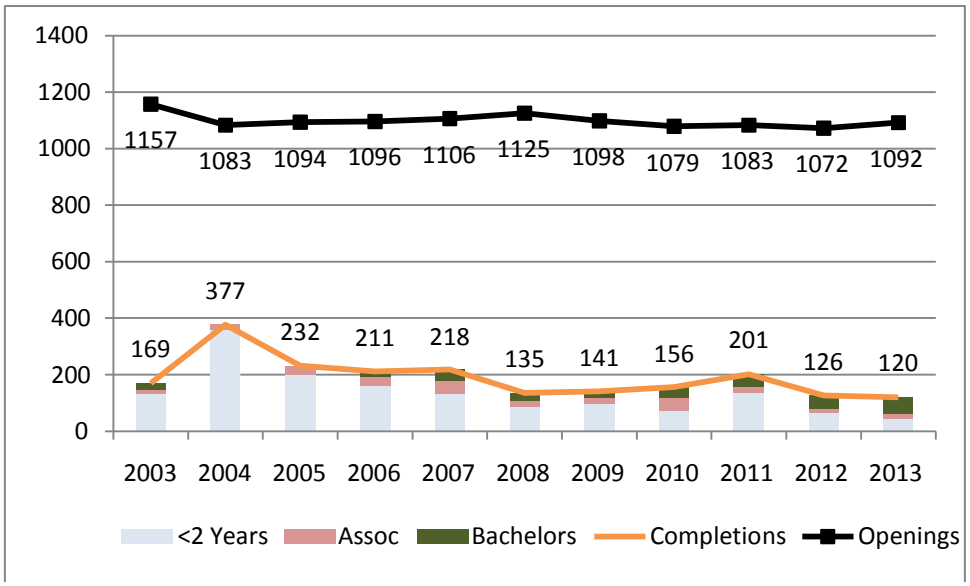
Table 5: National Jobs Outlook

	Average Salary	Growth: 2012-2022
Associate's Degree Entry		
Computer Support Specialist	$ 48,900	17%
Web Developer	$ 62,500	20%
Bachelor's Degree Entry		
Computer Systems Analyst	$ 79,680	25%
Information Security Analysts	$ 86,170	37%
Computer/Information System Managers	$ 120,950	15%
All Jobs	---	12%

Locally, job openings outstrip granted degrees in the field (Figure 5). However, it is worth noting that individuals with only an Associate's degree would be ineligible for many of these (only 8% of the jobs in the region in Management of Information Systems are held by individuals with 2 year degrees); most hold at least a Bachelors degree and fully one-quarter have at least a Masters. Students interested in the associate level entry programs could major in the CIST program and be equally qualified. Several professions related to the field have been deemed high priority occupations for the region: Computer Support Specialists and Network & Computer Systems Administrators.

Regionally, two schools also offer Associate's degrees in Information Systems Management and ten schools offer Bachelor's degrees. MCIT currently only has an articulation agreement with one (Peirce College). Temple University has said that it will not accept many MCIT courses for transfer. That leaves eight additional institutions for possible transfer agreements.

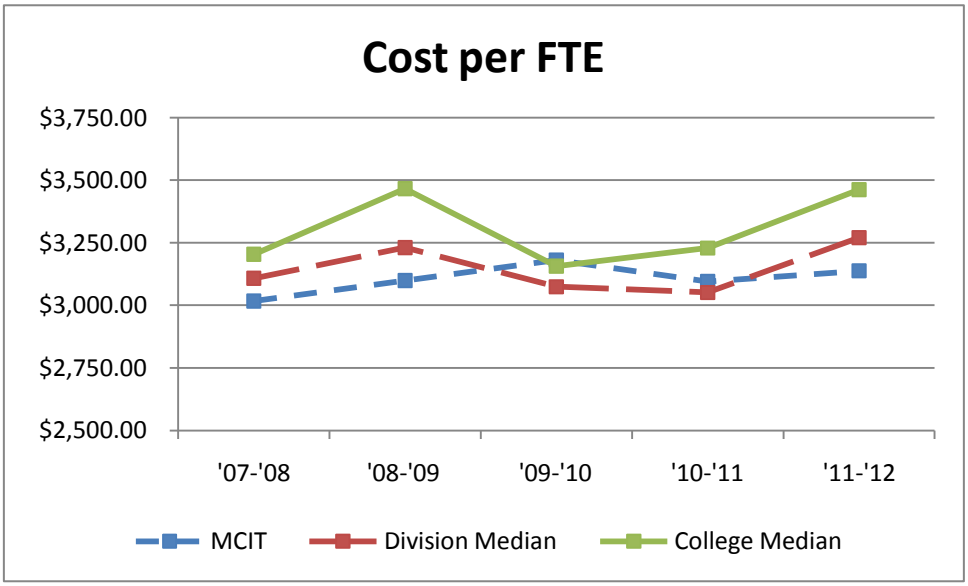
Figure 5: Regional Degree Completions and Job Openings[5]



VIII. Operating Costs

Program costs (per FTE) are lower than both the Business and Technology and the College's medians (Figure 6). The program's lower costs are assisted by the fact that there are no MCIT specific courses so program costs are spread over several teaching departments.

Figure 6: Operating Costs / FTE



[5] Includes degrees and job openings at all education levels.

IX. Findings and Recommendations

The MCIT program sits at an interesting juncture: it has had some growth since its inception and sits as a viable entry point into a field with clear growth potential. However, the program currently has little support from its constituent departments and a lack of strong leadership (particularly for the administrative parts of managing a program: program learning outcomes, technology plan, program management plan). QVIs indicate low scores on both quality and viability. Students are performing above their peers in the division but are stuck in the back half of the program, and graduations are not keeping pace with program growth.

1. Given the above, it is recommended that the program be closed as of Fall 2015.

Timeline: Fall 2014: begin process of program closure, current students contacted. Spring 2015: catalog changed to reflect closure. Fall 2014: No new students admitted. Spring 2018: final students graduated.

Persons Responsible: Department Chair, Assistant Dean. If the program does

not close it must do the following:

A. The program must find a full time faculty member to take over leadership responsibility for the program.

B. The program must complete one program learning outcome (PLO) by the end of the semester and have all program learning outcomes completed by the end of the academic year.

C. The program must increase its number of transfer or articulation agreements to ensure program viability.

D. The program will need to continue to monitor trends in both management and accounting to ensure that courses continue to meet the needs of the profession and requirements for transfer.

E. The program must, in response to low QVI scores, survey students to better understand their needs and challenges.

Community College of Philadelphia

Academic Program Audit: Engineering Science

Authors: John V
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Date: August 2014

I. Executive Summary

The Engineering Science Program at CCP prepares students who wish to complete a BS in a number of engineering fields for transfer. It is the fifth largest program in the MSHC division and has experienced little growth in the past five years. Students who enter into this select program perform well, overall. However, just over half leave the program before the second year. Once there, students seem to accumulate a large number of credits before graduating (averaging 20 more than they need to matriculate). As a transfer-oriented program, the faculty must ensure that the opportunities presented to students (from lab work and experience on equipment to internship options) are up to date and consistent with the desires of transfer institutions. While the program has completed course learning outcomes on schedule, there is a need to complete program learning outcomes. The faculty, in the past, have demonstrated an ability to use feedback to make changes to the program's curriculum and needs to build upon these past success to ensure the continued viability of the degree. Engineering, as a field has strong growth potential and a strong, low cost preparatory program like CCP's can be an important path to success for students.

II. Program

The Engineering Science curriculum provides a foundation for further study toward the bachelor's degree in engineering. As such, it parallels the first two years of engineering programs offered by major universities and is applicable to any engineering discipline. Students planning to pursue baccalaureate degrees in aerospace, biomedical, chemical, civil, electrical, industrial, mechanical, nuclear or petroleum engineering select this program. Students with other technical interests may consider other technological curricula.

A. Brief History of the Program

The Community College of Philadelphia Engineering Science Program first admitted students in 1968. It was designed for students planning to complete an associate in science degree and then pursue a baccalaureate degree in an engineering discipline such as aerospace, biomedical, chemical, civil, computer, electrical, industrial, materials, mechanical or nuclear engineering. It was also designed to provide access for students who typically would not enter baccalaureate engineering programs because of financial and/or academic limitations. In 1971, the Program was assigned to the Physics Department because physics courses provide a strong foundation for Engineering Science courses and because in most engineering schools the first two undergraduate years are similar to those offered by physics departments.

In 2008, the Engineering Science curriculum underwent a program audit. The Program's strengths were noted as the following:

1) The Engineering Science Program provides access for students who typically would not enter baccalaureate engineering programs because of financial and/or academic limitations.
2) The Curriculum provides students with experiences in using and programming state-of-the art equipment like that used in industry and is infused with the "hands-on"

and "learn by experience" philosophy of engineering education that has been adopted and advocated by Drexel University and other universities.

3) The courses in the Curriculum comprise a coherent set and provide students with the first two years of a mathematics and science background comparable to that received in a baccalaureate degree granting institution.
4) During the period studied for the audit, enrollment in the Program was diverse in terms of gender, ethnic/racial and age.

To address the weaknesses found with the Engineering Science Program the following recommendations were suggested:

Recommendation	Status
Course documentation for ENGR 221-Statics and ENGR 222-Dynamics should be reviewed.	ENGR 221 and ENGR were reviewed and revised in 2009 and 2010 respectively.
Engineering Science Program Faculty should determine the appropriate balance of engineering faculty and other Program Advisory Committee members for the 2007- 2008 academic year. An appropriate system of terms and term limits should be established for the Program Advisory Committee members, in accordance with "best practices" for Advisory Committees.	It was determined that while having an adequate representation from the four year Engineering Colleges and Universities, there was a lack of sufficient representation from the Engineering Industry. The Department has added additional representatives from industry to the Advisory Committee. The Advisory Committee recommended not imposing term limits because of the benefits that can come from individuals with a long association with the College (e.g. transfer representatives from 4 year Colleges and Universities).
Working with staff in the Office of Institutional Research, Program faculty will develop procedures for developing and maintain contact with Program graduates and others who might provide data to document the achievement of Program goals.	The current Program Supervisor for the Engineering Science Program has developed a method for tracking students in the program. In addition, transfer partners have agreed to provide data on students who transfer from CCP to their programs.
The Statement of Program Goals is aligned with the College's mission statement and supports the College's Vision Ideals. However it was developed more than ten years ago. It should be reviewed by the Program faculty and fine tuned to more accurately express the desired outcomes for current and future students.	Faculty reviewed the Program Goals and created new Program Learning Outcomes which are more in keeping with the desired outcomes for current and future students.
Program faculty should develop a Program Recruitment Plan to increase enrollment in the program.	Faculty have participated in a number of activities designed to increase enrollment but no formal plan was developed.

The current Program Curriculum combines the first two years of the traditional engineering content at colleges and universities using the ETDSL (Engineering Test, Design and Simulation Lab) methods pioneered by Drexel University. In the 1999-2000 academic year, the Physics Laboratory was remodeled and retrofitted to accommodate a new Engineering Design Laboratory, which included what were then, ten state-of-the-art, networked, computer-based workstations with instrumentation controls.

B. Curriculum Sequence

Course Number and Name	Prerequisites and Co-requisites	Credits	Gen Ed Req.
FIRST SEMESTER		**18**	
ENGR 102 - Engineering Design and Laboratory I	MATH 162	4	
MATH 171 - Calculus I	MATH 161 - MATH 162	4	Mathematics
CHEM 121 - College Chemistry I	CHEM 110 (or H.S. chemistry)	4	
ENGL 101 - English Composition I		3	ENGL 101
CIS 103 - Applied Computer Technology		3	Tech Comp
SECOND SEMESTER		**17**	
ENGR 202 - Engineering Design and Laboratory II	ENGR 102	4	Writing Intensive
PHYS 140 - Mechanics, Heat and Sound	MATH 171	5	Natural Science
MATH 172 - Calculus II	MATH 171	4	
MATH 270 - Linear Algebra	MATH 171, MATH 172	4	
SUMMER SESSION I		**3**	
ENGL 102 - The Research Paper	ENGL 101 with a "C" or better	3	ENGL 102
THIRD SEMESTER		**16**	
MATH 271 - Calculus III	MATH 172, MATH 270	4	
CHEM 122 - College Chemistry II	CHEM 121	4	
ENGR 221 - Statics1	PHYS 140, MATH 172	3	
PHYS 241 - Electricity, Magnetism and Light	PHYS 140, MATH 172	5	
FOURTH SEMESTER		**17**	
Humanities Elective		3	Humanities
Social Science Elective		3	Social Sciences
MATH 272 - Differential Equations	MATH 172, MATH 270	4	
ENGR 222 - Dynamics1	ENGR 221, MATH 271	3	
CSCI 111 - Computer Science I with Java or ENGR 205 - Materials Engineering	Math 118 placement or higher PHYS 241, MATH 172	4	
MINIMUM CREDITS NEEDED TO GRADUATE:			**71**

C. Curriculum Map

STUDENT LEARNING OUTCOMES	**Course**	**Course**	**Course**	**Course**	**Course**
Solve problems in algebra, trigonometry and calculus.	MATH 171	MATH 172	MATH 271		
Solve basic problems in science and engineering.	PHYS 140	PHYS 241	ENGR 221	ENGR 222	ENGR 205
Work in teams to implement projects.	ENGR 102	ENGR 202			
Use computers for data acquisition and instrumentation control.	ENGR 102	ENGR 202	ENGR 205		
Communicate technical information using written, verbal and graphical presentations.	ENGR 102	ENGR 202	ENGR 205	PHYS 140	PHYS 241

D. Revisions to the Curriculum

In 2000, Engineering Design and Laboratory I and II (ENGR 102, 202) were revised as was Materials Engineering (ENGR 205) in 2003. The course documentation for ENGR 221 (Vector Mechanics I – Statics) was updated and approved in 2009. Course documentation for ENGR 222 (Vector Mechanics II – Dynamics) was updated and approved in 2011. The updates include descriptions of how modern technology is being used in these classes.

E. Future directions in the field/program

Engineering, as a field, is experiencing strong growth potential; this is particularly true within certain subspecialties such as Computer Engineering (30% growth over the next ten years), Environmental Engineering (22%), Petrochemical Engineering (19%), and Biomedical Engineering (62%). These growth areas are driven by current global and societal needs (e.g. global warming, the demands of population increases). Additionally, future engineers will be expected to have increasing proficiency with technology (programming, networking, systems engineering, and the field has new subspecialties such as micro-engineering. As these fields develop, they will require technical specialists, with AS degrees, to repair and maintain these systems.

Within the program, there is a need to expose students to the vast array of opportunities for students, both in the workplace and in transfer. The program hopes to accomplish this through more direct exposure to the workplace for students (through field trips and summer internships) and through maintaining a curriculum that articulates well with transfer institutions.

3 Program Characteristics

A. Program Faculty

Faculty Member	Position	Courses Taught
Wojciech Alex Gontar PhD, Civil Engineering	Assistant Professor, Physics	Engineering Design and Laboratory I, Engineering Design and Laboratory II, Materials Engineering, Nanofabrication Manufacturing, Material, Safety, and Equipment Overview for Nanofabrication, Basic Nanofabrication Processes, Thin Films in Nanofabrication, Lithography for nanofabrication, Materials Modification in Nanofabrication, Characterization, Packaging, and Testing of Nanofabrication Structures, Vector Mechanics I, Vector Mechanics II

B. Engagement of Program Faculty

Faculty affiliated with the program have been involved with a number of projects including a summer engineering camp and as an advisor for the National Society of Black Engineers. Faculty have also created opportunities for student field trips to labs at Drexel and Temple Universities and the University of Pennsylvania.

During Summer 2014, eight Engineering Science students participated in a Research Program at Drexel University aimed at developing skills in the Biomedical Engineering field. This opportunity was made possible by the Raising Interest in STEM Education (RISE) program which is part of the Department of Education funded Minority Science and Engineering Improvement Program Grant (MSEIP) received by the College in Fall 2014. At the conclusion of the program the students were able to present their findings in a Drexel University Research Symposium. The Department Head of the Physics Department and Dr. Alex Gontar have been participating in joint events with Drexel University as a result of this grant. Engineering Science students have also been the recipient of tutoring by a Drexel Engineering graduate student. This initiative has been particularly beneficial in providing support for upper level Physics and Mathematics courses as well as the Engineering courses.

4 Program Characteristics

A. Student Profile

The program has had some growth over the past 5 years (27%, 22 people). The students in the program are overwhelmingly male (87%) and more likely to be Asian (17% vs. 7%), Full Time (52% vs. 31%), and College Ready (56% vs. 29%) than the students at the College at large. There are relatively fewer African Americans (32% vs. 48%) than the College.

Course enrollments are slightly higher than those of the rest of the College and the Division. With the exception of one year, they have run 3-5% higher than the College. The program also has a higher percentage of students with more than 30 credits. This is likely related to both the number of credits required by the program (71) and the large number of pre-requisites (which both lowers the number of developmental students and increases the total number of credits taken).

Table 1. Headcounts

		Fall 2008	Fall 2009	Fall 2010	Fall 2011	Fall 2012	5 Year Average	5 Year Change
	Headcount	81	85	89	83	103	88	27.16%
	FTE							
Engineering Science	Headcount	66	69	74	68	83	72	25.76%
	Headcount	5,305	6,189	6,638	6,913	6,704	6350	26.37%
	FTE							
MSHC	Headcount	3,702	4,339	4,702	4,796	4,655	4439	25.74%
	Headcount	17,327	19,047	19,502	19,752	18,956	18917	9.40%
	FTE							
College	Headcount	11,883	13,362	13,696	13,682	13,111	13147	10.33%

Figure 1. Year to Year Percent Change in FTE Headcounts

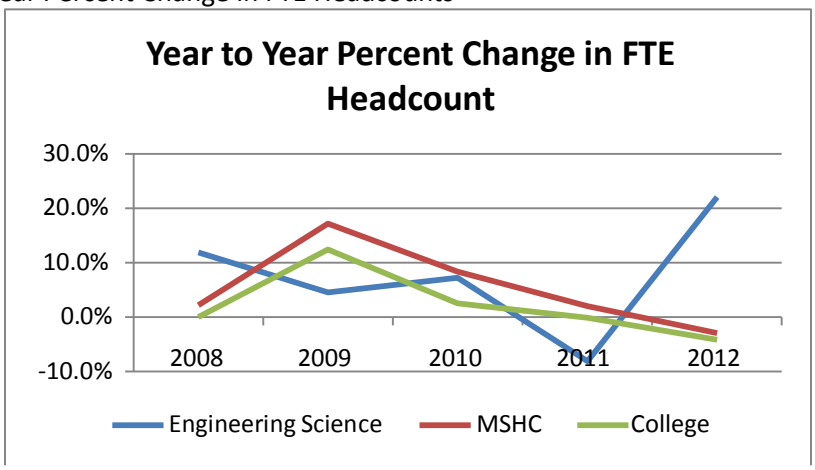


Table 2. Demographics

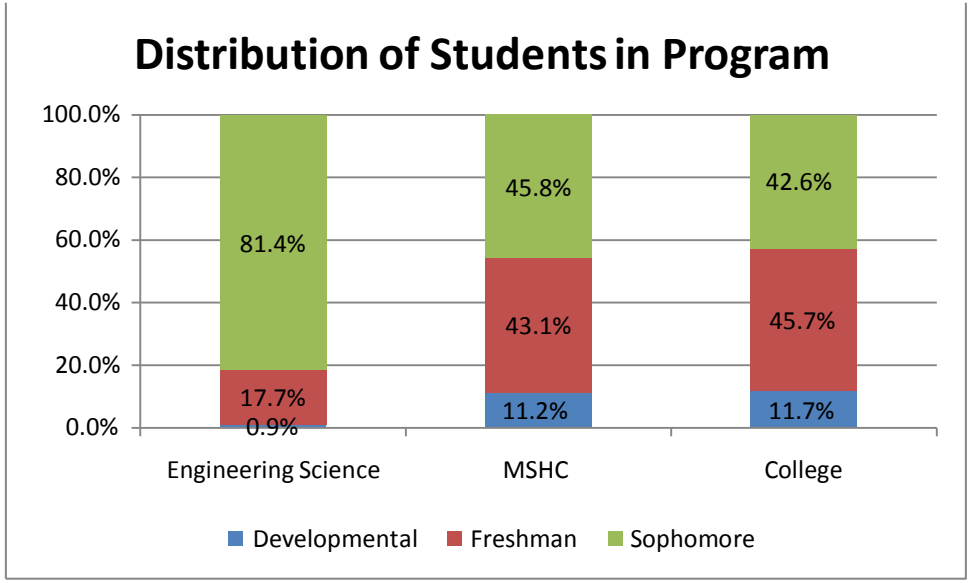
Demographics: Running 5 Year Average

	Engineering Science	MSHC	College
Female	11.1%	76.5%	65.0%
Male	87.4%	23.0%	34.4%
Unknown	1.5%	0.5%	0.6%
Native American	1.2%	0.4%	0.5%
Asian	17.1%	7.9%	7.2%
African American	32.0%	49.1%	48.2%
Latino/a	8.1%	6.0%	6.1%
White	26.2%	24.7%	25.2%
Other	6.5%	3.8%	3.8%
Unknown	8.9%	8.1%	9.1%
16 – 21	26.9%	29.6%	32.6%
22 - 29	48.7%	37.5%	35.4%
30 - 39	16.0%	20.7%	16.9%
40 +	6.3%	10.9%	13.6%
Unknown	2.2%	1.2%	1.5%
Full Time	51.5%	28.5%	31.4%
Part Time	48.5%	71.5%	68.6%
All Developmental	12.0%	31.5%	27.9%
Some Developmental	32.0%	46.0%	43.3%
College Ready	56.0%	22.5%	28.8%

Table 3. Course Enrollments

		Fall 2008	Spring 2009	Fall 2009	Spring 2010	Fall 2010	Spring 2011	Fall 2011	Spring 2012	Fall 2012	Spring 2013	Fall Average	Spring Average
Engineering Science	Courses	4	7	11	13	5	7	5	7	6	6	6.2	8
	Avg Enrollment	21	14.9	11	12.5	24	20.1	23.4	20.4	25.7	19.8	21.0	17.5
	Percent Filled	88%	67%	58%	54%	100%	90%	98%	89%	92%	83%	87%	77%
MSHC	Courses	981	1000	1038	1088	1004	1037	1045	958	975	985	1009	1014
	Avg Enrollment	21.3	20.9	22.0	21.5	23.5	22.8	22.4	23.0	22.0	21.6	22.2	22.0
	Percent Filled	87%	87%	90%	88%	88%	88%	89%	87%	88%	88%	88%	88%
College	Courses	2694	2829	2881	3096	3023	2940	2939	3007	2756	2738	2859	2922
	Avg Enrollment	21.2	21.2	22.3	22.0	21.9	22.1	21.8	21.6	22.2	22.1	21.9	21.8
	Percent Filled	83%	83%	87%	86%	85%	85%	84%	83%	86%	84%	85%	84%

Figure 2: Student Distribution Pattern



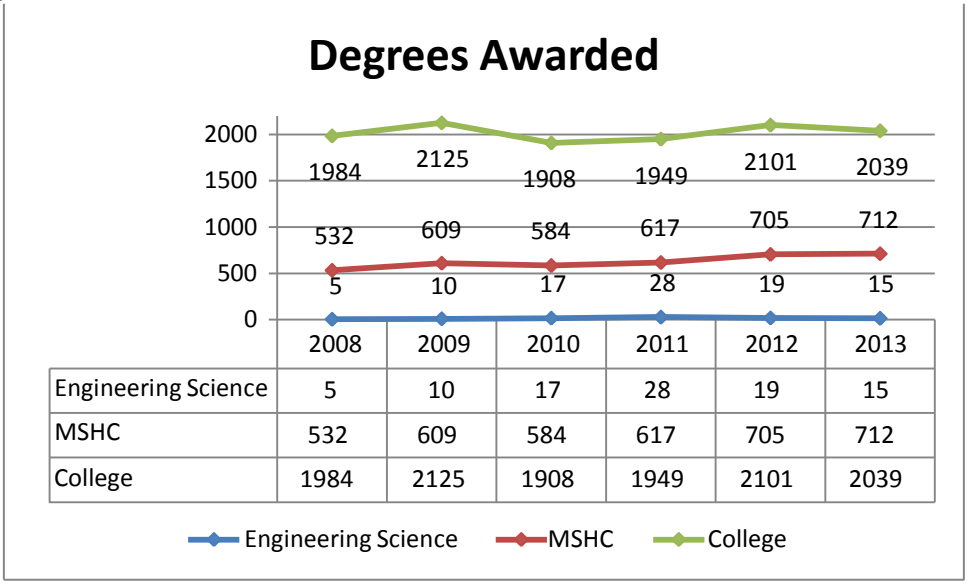
C. Student Outcomes

Students in the program are more likely to be in Good Standing, Return to the Same Program, and Graduate than students in the Division or the College. Students are also more likely to depart either graduated or with long term success and to hive higher GPAs. The number of degrees awarded is small (15 in 2013), and is in the middle of a three year downward trend (from a high of 28 in 2011). However, the Fall to Fall retention for the program could be increased (e.g. Fall to Fall data for 2012 = 57.3%) and would result in increasing the number of graduates. Students in Engineering are also attempting and completing a larger number of credits than their peers in the Division and the College (Table 6).

Table 4. Outcomes Data: 5 Year Averages

		Program	Division	College
Standing	Good Standing	89.0%	85.5%	84.1%
	Probation	9.2%	12.2%	13.2%
	Dropped	1.7%	2.4%	2.7%
Fall-Spring Retention	Returned/Same	76.9%	70.7%	65.6%
	Returned/Different	3.9%	3.4%	5.2%
	Graduated	1.4%	1.4%	2.0%
	Did Not Return	17.8%	24.5%	27.2%
Fall-Fall Retention	Returned/Same	46.0%	40.8%	36.5%
	Returned/Different	4.4%	7.0%	8.5%
	Graduated	16.6%	8.7%	8.2%
	Did Not Return	33.0%	43.6%	46.8%
Success at Departure	Graduated	21.8%	10.0%	9.9%
	Long Term Success	59.6%	38.9%	35.8%
	Short Term Success	6.1%	14.5%	17.7%
	Unsuccessful	12.6%	36.6%	36.6%
Course Outcomes	Course Completion	94.7%	89.6%	88.4%
	GPA	3.04	2.64	2.65

Table 5. Degrees Awarded



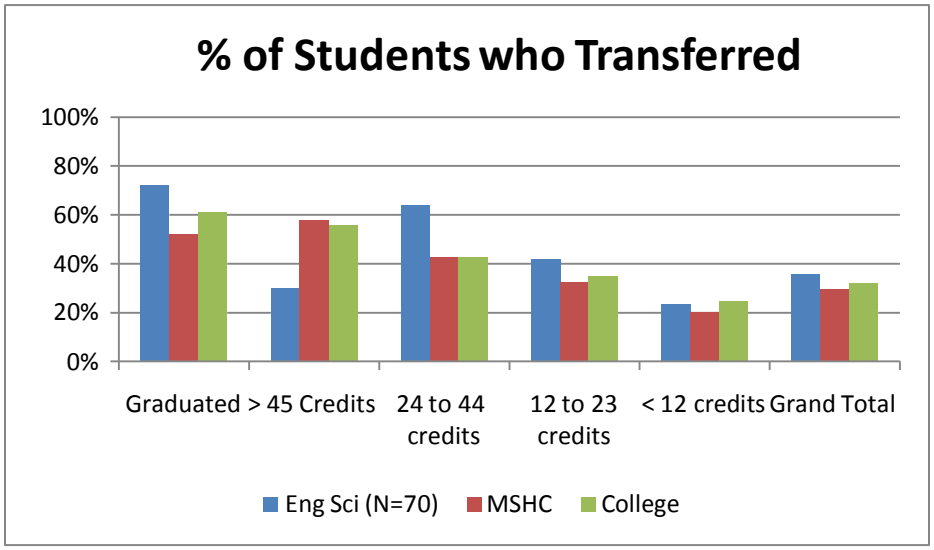
	2008	2009	2010	2011	2012	2013
Engineering Science	5	10	17	28	19	15
MSHC	532	609	584	617	705	712
College	1984	2125	1908	1949	2101	2039

Table 6: Median Scores for Graduates: Time to Degree and Credits Attempted/Earned

Median Scores for Graduates (2009-2013)

	Years to Degree	Credits Attempted	Credits Completed	GPA
Engineering	4.0	110	86	3.31
MSCHE	4.8	88	70	3.09
College	4.7	85	68	3.08

Figure 3. Transfer by Departure Status[1]



[1] Fall 2005- Fall 2009 Cohorts

V. Learning Outcomes and Assessment

A. Program Student Learning Outcomes

Upon completion of this program graduates will be able to:

Solve problems in algebra, trigonometry and calculus.
Solve basic problems in science and engineering.
Work in teams to implement projects.
Use computers for data acquisition and instrumentation control.
Communicate technical information using written, verbal and graphical presentations.
Transfer as engineering majors to bachelor's degree-granting institutions.

B. Outcomes Assessments

Student learning outcomes are completed along with a plan for assessment. However, to date no assessment of Program Learning Outcomes has been completed. All course level Student Learning Outcomes have been assessed at least once and have resulted in no changes in the courses. The Department has revised the assessment method and has an aggressive plan to re-assess course learning outcomes during the Fall 2014 and Spring 2015 semesters. See Appendix A for results.

C. Quality Viability Indicators

The Quality/Viability Index has been completed for four years with the following results:

Table 7: QVI Results (2010-2013)

Academic Year	Quality Average*	Viability Average*
2010-2011	4	2.7
2011-2012	3.4	2.4
2012-2013	3.0	2.8
2013-2014	3.5	2.0

***Scale is based on a ranking of 1 (lowest) to 4 (highest)**

The lower viability average is mainly derived from the lower Fall to Fall Retention and Graduation Rate. Some of the results can be explained by the fact that some students transfer to a four year College or University at the end of their first year in the Program. However, this has not been documented.

VI. Resources

Currently there is one lab for both Engineering Science and Physics courses. This limits the types of experiments that can be done in Engineering Science and cannot accommodate the current number of Engineering students requesting to take the Engineering Design and laboratory courses (ENGR 101 & 202). In addition, Engineering Science students are required to work on student projects using a team approach.

By the end of the Summer 2014 semester a new Engineering Technology lab will have been completed. This should alleviate some of the laboratory space needs indicated above. However, funds will need to

be secured for lab furniture, a smart board and white boards to enable the laboratory space to be completely viable.

VII. Demand

Several occupations within Engineering are currently listed as High Priority Occupations (HPOs) by the State. These include Civil Engineering, Industrial Engineering, and Mechanical Engineering. Although these are at the Bacherlor's level; there are also several at the Associate's level as well: Electro-Mechanical Technicians and Industrial Technicians.

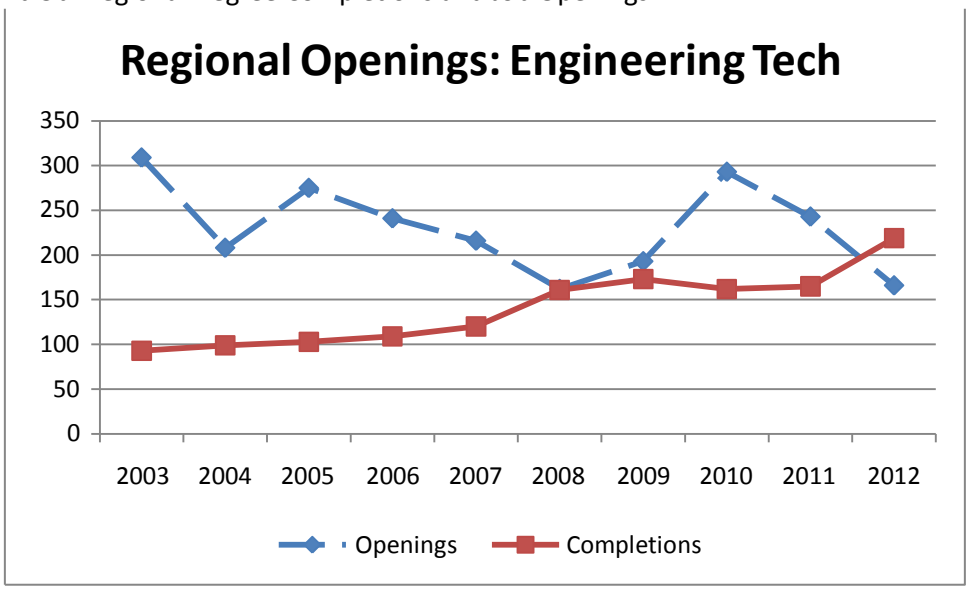
The national growth opportunities for AS level jobs are generally lower than the national average (Table 8), with the exception of environmental engineering technology. Regionally, the number of employment opportunities for AS level positions has outpaced the number of regional AS degree completions over the past 10 years, but this has been closing (Figure 3a). For advanced degrees, completions have outpaced job openings (3b).

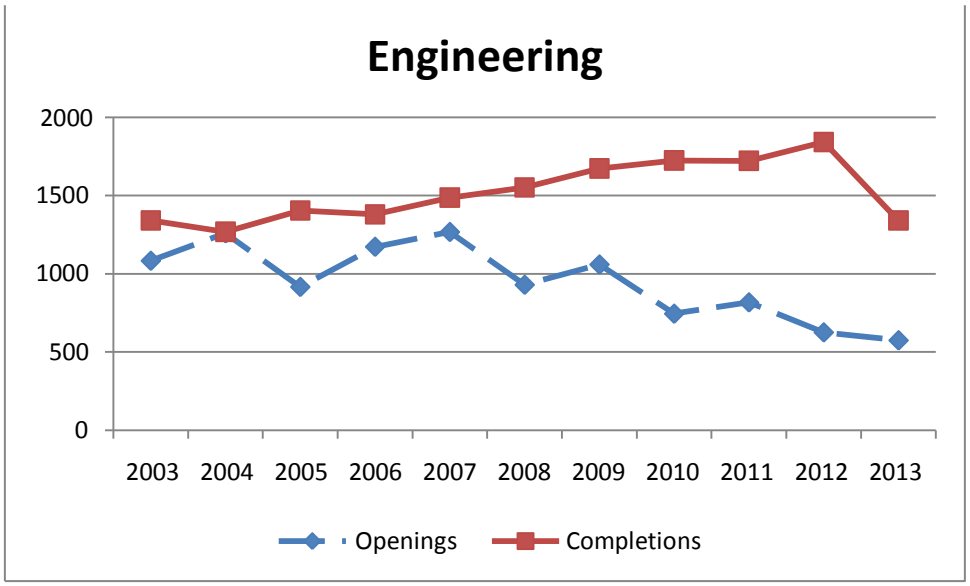
Only one other school in the area offers an Associate's level degree in engineering. Bachelor's degrees are offered by seven area institutions. The Engineering Science Program has Program to Program articulation agreements with Philadelphia University, Temple University and Widener University. The agreements have been recently reviewed and are up-to-date.

Table 8: National Jobs Outlook

	Job Title	Growth 2010-2020	Mean Annual Salary
AS Degrees	AeroSpace Tech	0%	$61,530
	Civil Tech	1%	$47,560
	Electrical Tech	0%	$57,850
	Electro-Mechanical Tech	4%	$51,820
	Environmental Tech	18%	$45,350
	Industrial Tech	-3%	$50,980
	Mechanical Tech	5%	$51,980
BS Degrees	AeroSpace Engineer	7%	$103,720
	Civil Engineer	20%	$79,340
	Electrical Engineer	4%	$89,630
	Environmental Engineer	15%	$80,890
	Industrial Engineer	5%	$78,860
	Mechanical Engineer	5%	$80,580
	Nuclear Engineer	9%	$104,720
	Petroleum Engineer	26%	$130,280
	All Jobs	14%	---

Figures 3a and 3b: Regional Degree Completions and Job Openings

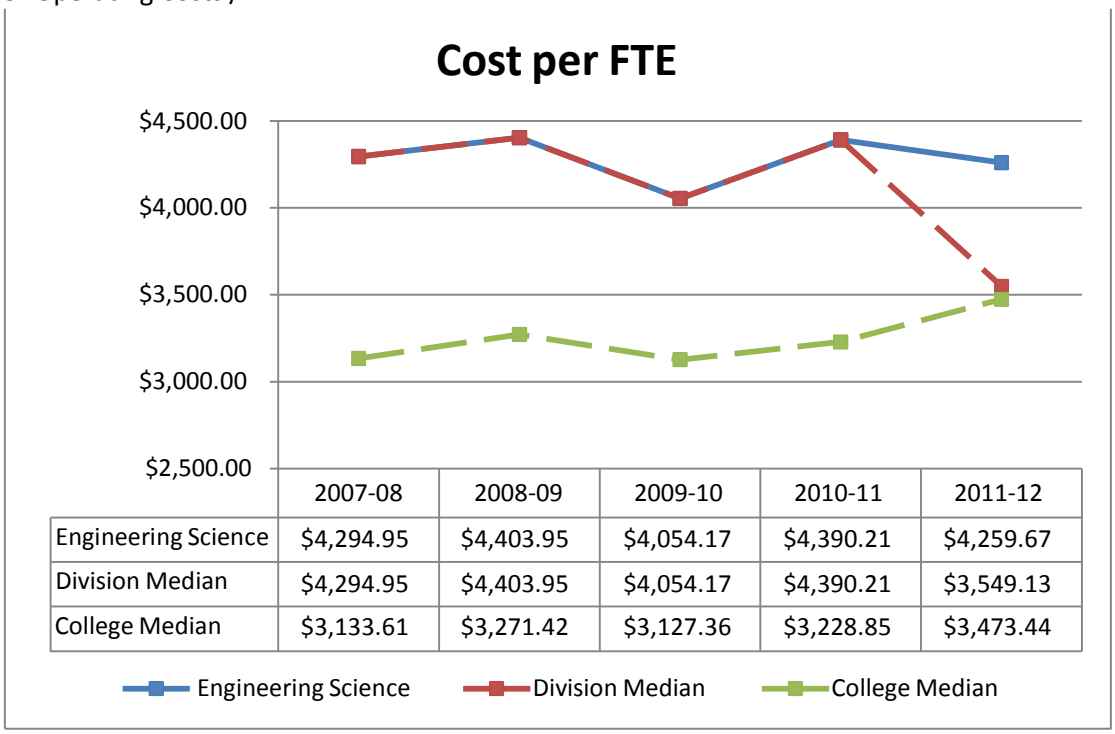




VIII. Operating Costs

Engineering Science's program costs have remained fairly constant over the past 4 years and have been, generally, the same as the median for the Division.

Table 9: Operating Costs / FTE



	2007-08	2008-09	2009-10	2010-11	2011-12
Engineering Science	$4,294.95	$4,403.95	$4,054.17	$4,390.21	$4,259.67
Division Median	$4,294.95	$4,403.95	$4,054.17	$4,390.21	$3,549.13
College Median	$3,133.61	$3,271.42	$3,127.36	$3,228.85	$3,473.44

IX. Findings and Recommendations

1. Complete Program Learning Outcome Assessments. At least one Program Learning Outcome should be assessed, analyzed, discussed, and disseminated during the Fall 2014 semester. All Program Learning Outcomes must be likewise completed by the end of the Spring 2015 semester. Program Learning Outcome and Course Learning Outcome assessment results should be discussed at a Department meeting and during the Spring 2015 Advisory Committee Meeting.

   Timeline: One program outcome completed by end of Fall 2014.
   All program outcomes completed by end of Spring 2015.
   Persons responsible: Department Chair, Program Faculty.

2. Refine assessment for Course Learning Outcomes and analyzed and communicate results to internal and external constituencies during the Fall 2014 and Spring 2015 semesters. Although course outcomes have been completed for many courses, the results are not clearly documented in an immediately accessible way.

   Timeline: Rewrite Course SLO Documents by end of Fall 2014.
   Provide evidence of dissemination of results and any changes made to program or courses as a result by end of Spring 2015.
   Persons responsible: Department Faculty and Chair, Dean, Director for Academic Assessment.

3. Cultivate Articulation Agreements. Review the Engineering Science Curriculum in light of any curricular or pedagogical changes that are occurring at regional transfer program institutions in order to be sure that course content information is up-to-date. A report on the findings and any resulting action plans is due by Summer 2015. Develop a Program to Program Articulation agreement with Drexel University by Fall 2015.

   Timeline: Program review completed by Summer 2015.
   Articulation agreement completed by Fall 2015.
   Persons responsible: Department Chair.

4. Two issues exist in the context of program management: 1) students are leaving the program early (for transfer) and not progressing to the second year; and 2) students that do progress to second year are accumulating a large number of credits before graduating. The program needs to investigate and document the reasons for both of these issues.

   Timeline: A report of the results prepared and shared with the Dean by Fall 2015.
   Persons responsible: Department Chair.

5. The program needs to determine ways in which it can stay current with the field of engineering—both in terms of transfer and employment—ensuring that opportunities for student learning are adequate and aligned with the future of the field. To accomplish this, the

program needs to inventory laboratory equipment and procedures, internships and/or externships possibilities, increasing diversity within the field, and opportunities for research experiences. These should be compared to requirements and best practices at transfer institutions and within the field of engineering pedagogy. This should begin with discussions at the Spring 2015 Advisory Committee and a report of the findings presented to the Dean by Fall 2015. The findings should include an assessment of the future of the field and how CCPs program fits into that future.

Timeline: Report submitted to the Dean by end of Fall 2015.

Persons responsible: Department Chair, Program Faculty.

ENGINEERING PROGRAM LEARNING OUTCOMES PLAN FOR ASSESSMENT – FACULTY GRID

Name: Wojciech Alex Gontar Date: _12/04/2011 Redo

COURSE AND SECTION: Engr.102	STUDENT LEARNING OUTCOMES:	ASSESSMENT METHODOLOGY	SEMESTER EVALUATED	ASSESSMENT BENCHMARK	NUMBER OF STUDENTS EVALUATED	NUMBER AND PERCENT ACHIEVING THE BENCHMARK	SUGGESTIONS FOR ACTION PLAN
1	Understand the application of the Problem Solving Strategies Method in Engineering	Tests and discussion on base of real engineering projects taken from two manufacturing companies		About 75% students in class will be correct	44-48	42 students (87%)	
2	Understand the principles of the design process and how to deal with technical drawings	Problems solving on tests including projections of basic figures		In average at least 75% will be correct	44-48	40 students (83%)	
3	Solving theoretical problems related to Ohm's Law, basic heat transfer, applications of statistics and discussion of sources of error in engineering measurement.	Problem solving questions on tests and practical evaluations of theories in laboratory using modern engineering equipment		About 75% of class will be correct	44-48	42students (87%)	
4	Use laboratory equipment and work with other students as a team	Work on electrical circuits in laboratory with a team members		At least 75% students will be correct	44-48	44 students (92%)	

Remarks:

ENGINEERING PROGRAM LEARNING OUTCOMES PLAN FOR ASSESSMENT – FACULTY GRID

Name: _Wojciech Alex Gontar Date: _12/04/2011 Redo

COURSE AND SECTION	STUDENT LEARNING OUTCOMES	ASSESSMENT METHODOLOGY	SEMESTER EVALUATED	ASSESSMENT BENCHMARK	NUMBER OF STUDENTS EVALUATED	NUMBER AND PERCENT ACHIEVING THE BENCHMARK	SUGGESTIONS FOR ACTION PLAN
Engr. 202	Understand the application of the CAD Program in the technical drawing	Use Cad Program during Lab. session		Class average will be 80% correct	40-44	40 students (91%)	
	Have a basic knowledge of Geosynthetics and Geotechnical Engineering	Make a Landfill Model as a Laboratory Project		About 80% students will be correct	40-44	40 students (91%)	
	Be able to solve some moderately advanced word problems in Geotechnical Engineering and Geosynthetics	Problem solving problems on test		Over 80% students will be correct	40-44	40 students (91%)	
	Understand AC circuits, Transformators and Transducers	Numerical problems on tests and creating AC circuits during Lab. session		Class average will be 80% correct	40-44	40 students (91%)	
	Know how to use National Instruments' *LabVIEW* program	Use the LabVIEW program to complete the circuits during a lab session.		Over 80% students will be correct	40-44	40 students (91%)	
	Know how to use the *Power Point* program	Final Engineering presentation in Power Point		Class average will be over 85% correct	40-44	40 students (91%)	

Remarks:

ENGINEERING PROGRAM LEARNING OUTCOMES PLAN FOR ASSESSMENT – FACULTY GRID

Name: Wojciech Alex Gontar Date: Redo

ENGR 205	STUDENT LEARNING OUTCOMES	ASSESSMENT METHODOLOGY	SEMESTER EVALUATED	ASSESSMENT BENCHMARK	NUMBER OF STUDENTS EVALUATED	NUMBER AND PERCENT ACHIEVING THE BENCHMARK	SUGGESTIONS FOR ACTION PLAN
1.	Understand the relation between the atomic structure and physical properties of materials	Showing different crystalline models in class, discussion, home assignment, tests, final, experiment in Laboratory		On base of 4 tests, H.W. and final at least 80% students will be correct	20-24	20-22 (83%)	
2.	Understand solids on atomic level in terms of bonding and energy	Solving numerical problems, tests, home assignments, final		On base of 4 tests, H.W. and final over 80% students understand the concept	20-24	20-22 (83%)	
3.	Establish a quantitative picture of the structure of crystalline and non-crystalline solids	Field trip to Atomic Force Microscope Lab. at Drexel, tests, home assignments		On base of 4 tests, Lab. Reports, H.W. and final at least 80% students will understand the topic	20-24	20-22 (83%)	
4.	Be able to explain the electrical and magnetic properties of materials and interpret their thermal and optical behavior	Discussion, solving engineering problems in class, home assignments, tests, final experiment in laboratory		On base of 4 tests, H.W. Lab. Reports, and final about 80% students will be correct	20-24	20-22 (83%)	
5.	Understand the methods of materials testing	Trip to Mechanical Testing Lab. at the University of Pennsylvania, solving numerical problems, experiment in Laboratory, tests, H.W. final		On base of 4 tests, Lab. Reports H.W. and final over 80% students will understand the concept	20-24	20-22 (83%)	

Remarks:

ENGINEERING PROGRAM LEARNING OUTCOMES PLAN FOR ASSESSMENT – FACULTY GRID

Name: Wojciech Alex Gontar Date: _12/28/2011 Redo

ENGR 221 (Statics)	STUDENT LEARNING OUTCOMES	ASSESSMENT METHODOLOGY	SEMESTER EVALUATED	ASSESSMENT BENCHMARK	NUMBER OF STUDENTS EVALUATED	NUMBER AND PERCENT ACHIEVING THE BENCHMARK	SUGGESTIONS FOR ACTION PLAN
1	Understand the concept and application of Statics principles in Engineering	Discussion and engineering structures analysis using Smart Podium, home assignments, tests		On base of 4 tests and final, in average about 80% students will understand the concept	20-24	20 (83%)	
2.	Know how to apply vector operations to solve engineering problems in Statics	Tests and home assignments		On base of 4 tests and final, at least 80% students will be correct	20-24	21-22 (88%)	
3.	Be able to analyze trusses, frames and machines	Tests, home assignments and discussion in class about graphical and analytical methods of solving problems.		On base of 4 tests and final, class average will be 80% correct	20-24	21-22 (88%)	
4.	Know how to solve moderately advanced engineering problems in Statics including moments of inertia, centroids, work and energy and friction, using calculus based mathematics	Discussion, graphical interpretation and analytical methods of solving engineering problems in class. Tests, home assignments, and final.		On base of 4 tests and final, over 80% students will be correct	20-24	21-22 (88%)	

Remarks:

ENGINEERING PROGRAM LEARNING OUTCOMES PLAN FOR ASSESSMENT – FACULTY GRID

Name: Wojciech Alex Gontar Date: _12/28/2011 Redo

ENGR 222 (Dynamics)	STUDENT LEARNING OUTCOMES	ASSESSMENT METHODOLOGY	SEMESTER EVALUATED	ASSESSMENT BENCHMARK	NUMBER OF STUDENTS EVALUATED	NUMBER AND PERCENT ACHIEVING THE BENCHMARK	SUGGESTIONS FOR ACTION PLAN
1.	Understand the concept of rectilinear and curvilinear motions and know how to use a scientific methods to solve moderately advanced engineering problems in Dynamics.	Discussion in class. Graphical interpretation of motion using Smart Podium. Tests and Home Assignments		On base of 4 tests and final, at least of 80% students will be correct	20-24	21-22 (88%)	
2.	Know how to apply calculus based mathematics in the engineering problems solving of in Dynamics.	Problem solving questions on tests, home assignments, final exam		In average about 80% will understand the concept (on base on tests and H.W.)	20-24	21-22 (88%)	
3.	Understand the concept of work and energy, power, conservation of energy, impuls and momentum theorem, impact, general plane motion, absolute and relative acceleration in the system of rigid body.	Home assignments, tests and final		On base of tests over 80% students will be correct.	20-24	21-22 (88%)	
4.	Identify a scientific engineering problem in Dynamics and be able to solve it analytically and show the solution graphically in three dimensional space.	Problem solving questions on test, home assignments, and final test.		On base of 4 tests, final and H.W. about 80% students will be correct	20-24	21-22 (88%)	

Remarks: