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2018 Program Review Report for:

Bergen County Community College
Division of Mathematics, Science, Technology

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I thank the Bergen County Community College Division of Mathematics, Science, Technology faculty and administration for inviting me to share some of my perspectives on the Division programs that are currently under review. As Associate Dean for Academic Affairs for NJIT's College of Architecture and Design, I am interested in how well our partners at the Community Colleges are preparing students to perform in 4 and 5 year programs or going directly into the workforce. What follows is a brief report based on my observations and discussions with faculty, staff and administrators in late June of 2018.

Bergen Community College is a key player in New Jersey's workforce education and career development sector and provides students cost effective options to explore and build new careers in a rapidly changing employment landscape. The four programs under review represent educational opportunities for students in sectors that continue to grow and for which there is a dearth of skilled labor. The administration and faculty teaching in the degree programs seem committed to continuous improvement through regular program review with both internal and external subject experts participating.

This report serves two related purposes:

1. To provide external third party recommendations to support and improve the Drafting & Design Technology AAS Degree & CAD Certificate, the Manufacturing Technology AAS, Electronics Technology, and General Engineering Technology Degree programs.

2. To highlight continuing opportunities for enrollment growth specifically in the Drafting & Design Technology AAS Degree & CAD Certificate through the Construction Document Technician Track administered through BCC's Division of Continuing Education Corporate and Public Sector Training.

Existing Programs

There are numerous opportunities for enrollment growth in these programs as low skilled workers in Bergen and surrounding counties seek to improve their employment prospects through new skillsets and knowledge acquisition in these technical fields. That said, it may make

sense to consider consolidating two of the four programs under review that have little that distinguishes them from each other.

The Electronics Technology and General Engineering Technology Degree programs share all but three courses. The three distinguishing courses in the Electronics Technology are:

ELC100 Introduction to Electronics Technology,
ELC214 Communications Systems I and
ELC215 Communications Systems II

These differ from the General Engineering Technology's unique offerings:

DFT207 Drafting II,
DFT209 Civil Engineering Methods,
and either DFT210 Computer Aided Drafting I OR MFG119 ProEngineer Design I.

The first three are described in the college catalog as overview courses for Electronics and Communication Technology with some exercises in basic graphic representation in ELC100. The second three are primarily graphic representation and analysis courses specialized for different design and engineering disciplines. It may be possible to concentrate the two degree programs into a single one without having to sacrifice students' ability to concentrate on the discipline they ultimately wish to pursue as a career. This may be done through different formal "tracks."

The track structure opens other options for greater flexibility beyond this specific instance as well. Various customized tracks in Associate in Science Professional Studies General Studies Degree may afford self-directed students, in concert with their academic advisers, ways to combine a variety of technical courses into useful hybrid degrees. This would be especially useful in building on demand industry partnerships for continuing education and workforce "up-skill" tracks. Flexible alternative pathways meet the need for both

One notable deficiency is the lack of a full time faculty member in the Manufacturing Technology AAS Degree Program. While the program seems to be well constructed and the course descriptions are relevant, the program would benefit from full faculty to steward new initiatives that continue to keep all offerings relevant and perhaps create new pathways to industry and 4 year university programs. One unique feature of this program is the fabrication facility. This facility helps meet the growing national "maker space" demand and supports the increasing need for hands on practice and skill building.

Another fortuitous condition, created either by happy accident or more likely by thoughtful design, is the adjacent computer lab with a full suite of digital design software. These two facilities, taken together, provide ideal conditions for 21st century design and manufacture education. Students need to practice using digital design techniques to CNC subtractive and 3D printing additive machine technology in order to move from concept, to physical proofs or prototypes, to mass production of an object or component. The curriculum is well structured to take advantage of these existing facilities.

There are other College demands on these enviable facilities. Continuing Education programs take advantage of the equipment and fabrication space by scheduling classes on a regular basis. It is critical to make sure lines of communication are open between regular classes and continuing education classes. Adequate support for equipment upkeep and consumable materials used in the course of teaching and learning in all courses is required in order to insure the sustainability of the facilities themselves and, by extension, of the programs that use them.

Growth Potential

There are opportunities to expand future offerings in the Manufacturing Technology AAS Degree Program by including a creative aspect to the technical curriculum. A new Industrial Design partner track in conjunction with the Drafting & Design Technology AAS Degree & CAD Certificate program is one possibility. This could offer a manufacturing skills rich and cost effective option for many students who wish to study Industrial Design at the tertiary level. With a slight change in curricular structure that emphasizes design over drafting, this could also form the basis of a preparatory architectural design track that could prepare students to regularly enter directly into the 3rd studio year of a pre-professional 4 year or professional 5 year architecture program. This subtle shift would provide significant cost savings to Bergen County students reducing the cost of a degree by tens of thousands of dollars.

There is an immediate opportunity for enrollment growth specifically in the Drafting & Design Technology AAS Degree & CAD Certificate through the new Construction Document Technician Track administered through BCC's Division of Continuing Education Corporate and Public Sector Training. The subject matter in Drafting & Design Technology prepares students well to sit for the CDT exam and gain an excellent industry recognized credential. I would like to note the extraordinary efforts by BCC faculty and administrators alike to build and deliver this new track that will make direct and immediate impacts in New Jersey's high priority workforce development plans. They demonstrate a clear willingness and ability to take advantage of existing federal (NSF) and state (NJWLD) grants to immediately increase opportunities available to underemployed Bergen County citizens wishing to enter the Architecture/Engineering/Construction sector. They have creatively combined two different but complementary grants:

1. A National Science Foundation grant for "Increasing Technologist Preparedness in the Built Environment" and its financially supported goal to increase the number of people taking and passing the industry valued Construction Document Technician Exam

2. A New Jersey Workforce and Labor Development grant to create a Construction and Utility Talent Development Center in order to help achieve the goal of 65% employment by 2015 through funding training of job seekers tied to guaranteed jobs once they attain an industry recognized credential.

In addition to job seekers categorized as disadvantaged, dislocated or lacking basic skills, or those in existing jobs seeking to upskill in order to shift into the A/E/C industry, one promising cohort to benefit from this preparatory certificate track would be veterans who have recently exited the US military. Outreach to them, may yield disproportionately positive enrollment results.

The growth opportunities available stem mostly from an already robust set of offerings in the Drafting & Design Technology AAS Degree & CAD Certificate, the Manufacturing Technology AAS, Electronics Technology, and General Engineering Technology Degree programs. Creatively leveraging external funding opportunities and striving for continuous improvement expands opportunities in a budget neutral way. Again this is a testament to the hard work being done by the Bergen Community College's Division of Mathematics, Science, Technology faculty, and the staff, and administration that supports them and their students.

Thanks again to the faculty and administration and especially the Chair of the internal Program Review Team, Vince Benanti, Dean of the Division, P.J. Ricatto, and Provost William Mullany, who conducted the visit in June. I look forward to see how these programs continue to develop and improve over the short and mid and long term. Please don't hesitate to contact me if you need any clarification or further details on this report.

Respectfully submitted,

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