PRESENTATION TO BOARD OF GOVERNORS

Program Title:	Manufacturing Engineering Technician
Credential:	Ontario College Diploma
Program Length:	Two Years
School:	Advanced Technology
Dean:	Christopher Janzen
Proposed Start Date:	Fall 2013

PURPOSE

The Manufacturing Engineering Technician (MET) Ontario College Diploma program prepares students for entry into the manufacturing engineering industry. It is offered over two years and students prepare for an extensive variety of dynamic technical positions requiring strong, mechanically-oriented backgrounds within the manufacturing industry. In a combination of classroom and lab-based environments, students develop knowledge and skills essential to succeed in the multifaceted, fast-paced field of manufacturing engineering.

Graduates of this program may find employment in areas such as research and development, defence, aerospace, medical device manufacturing, and consumer and industrial product industries.

BACKGROUND

The MET program is replacing the Mechanical Technician – Toolmaking program following the recommendations of the Strategic Programs and Services Planning Project (SPSP). The SPSP Final Report noted that manufacturing was a significant employment sector in the region and recommended consultation with employers to determine current and future needs. Employers revealed that recruiting skilled and experienced personnel represents a strategic challenge for nearly one-half of manufacturing companies in Ontario. On a national basis, 25% of companies find it difficult to recruit entry-level employees with the appropriate skills and experience, and more than 10% find it difficult to fill technical positions. A recent international survey revealed that the job of technician has become the most difficult one to fill. Further, recent studies show that Eastern Ontario's manufacturing sector expects to see a five-per-cent expansion over the next three years. Eastern Ontario has 600 manufacturing companies employing close to 30,000 employees. The Skills Needs Analysis conducted by the Eastern Ontario Manufacturers' Network, showed that the region's manufacturing sector would require an estimated 1,500 new hires by 2013, based on growth projections. The consultation and available data led to the conclusion that the Mechanical Technician - Toolmaking program be replaced by a broad based program, namely the MET program.

CONSIDERATIONS

(i) **Evidence of Need**

There is demand for the skill set that the proposed program will provide. The new manufacturing landscape in Ontario means that there are fewer lower-level jobs, but significant demand for highly skilled workers in several sectors. In an address to the Canadian Manufacturers & Exporters in September 2012, Bombardier's CEO stated that Ontario's current manufacturing crisis is really an innovation and productivity crisis. In a recent report, the Ottawa Integrated Local Labour Market Planning acknowledged that conventional manufacturing is a shrinking part of the Ontario, and Ottawa, economy. However, it points to distinct knowledge advantages required by the

manufacturing sector in areas such as green technology and green manufacturing, ICT proto-typing and manufacturing healthcare products. BioTalent Canada, an Ottawa-based non-profit group reported that manufacturing skills are desperately needed in the Biotech industry.

A Labor Market Analysis for the MET program proposal was conducted by Sheldon Polowin Consulting Group Inc. in December 2011. The study revealed that Canada's manufacturing sector faces serious human resource challenges. They include skill and labor shortages, difficulties attracting and retaining employees, and the need to replace a large number of people expected to retire in the next decade. It concluded that despite the economic difficulties that the domestic manufacturing sector has faced in recent years, the number of manufacturing engineering technicians employed in Ontario's labor force is projected to increase marginally over the medium-to-long term. The industry faces systemic skill and labor shortages, and the labor force is aging. These and other factors suggest that there is an economic need for the proposed program.

(ii) **Student Interest**

There are only a few colleges in Ontario that offer a comparable program. Among these, the closest geographically is Belleville's Loyalist College. Although the MET program will be similar to competing programs in some respects, it will be much broader in scope. Existing programs are generally geared towards specific industries. Graduates of the proposed program will be able to apply their skills to a wider range of industries and situations, which will increase their employment prospects. It is anticipated that Algonquin's program would attract direct entry applicants and international students, as well as those with prior postsecondary education.

(iii) **Staffing**

No new hires are anticipated. The Mechanical Technician – Toolmaking program has 4 full-time faculty. In year 1, two faculty will deliver courses in the new program while the other two will deliver courses in the Mechanical Technician – Toolmaking program. It is envisioned that an equivalent of 3.5 FTE professors will be assigned to the new program after year 2.

(iv) **Admissions Requirements**

Program Eligibility:

- English, Grade 12 (ENG4C or equivalent).
- Mathematics, Grade 12 (MAP4C or equivalent). Should the number of qualified applicants exceed the number of available spaces, applicants will be selected on the basis of their proficiency in English.

(v) **Advisory Committee Support**

The Manufacturing Engineering Technician Advisory Committee met on December 8, 2011. The Committee recognized the need for such a program in the community and after reviewing the curriculum, unanimously endorsed the program.

(vi) **Strategic Alignment**

The implementation of this program reflects the strategic directions of the College including responding to an SPSP recommendation to revise an existing program, the commitment to digital learning with 24% online, alternative delivery, leveraging of our relationships with business and industry with a mandatory field placement, and meeting the needs of students and the community.

Appendix 1: Program of Study
Appendix 2: Cash Flow Analysis

RECOMMENDATION

That the Board of Governors approve the Manufacturing Engineering Technician Ontario College Diploma program effective Fall 2013 and seek validation of the program title and outcomes from the Credentials Validation Service and approval for funding from the Ministry of Training, Colleges and Universities.

Appendix 1: Program of Study

LEVEL 1 – 15 Weeks

COURSE NUMBER	COURSE TITLE	Hours					
		Theory		Lab		Field / Clinical	Total Hours
		In class	Online	In class	Online		
MFG8510	Introduction to Manufacturing	30	15				45
DRA8253	Understanding Engineering Drawings	45	15				60
MFG8511	Manufacturing Application Theory I	30	15				45
MFG8512	Manufacturing Application I			75			75
MAT8050	Geometry and Trigonometry	45					45
ENL1813T	Communications I	30	15				45
ENG8313	Measurement Principles	15		30			45
	TOTAL LEVEL HOURS	**180**	**60**	**120**			**360**

LEVEL 2 – 15 Weeks

COURSE NUMBER	COURSE TITLE	Hours					
		Theory		Lab		Field / Clinical	Total Hours
		In class	Online	In class	Online		
CAD8514	Computer-Aided Drafting and Modelling		15	45			60
CAM8501	CNC Part Programming – Theory			30	15		45
CAM8505	CNC Part Programming – Lab			60			60
MAT8051	Algebra	45					45
ELE8213	Basic Electricity			45			45
CON8430	The Impact of Computers in a Computer Age		45				45
ENG8319	Quality Control		45				45
FLDxxxx	Field Placement					92	92
	TOTAL LEVEL HOURS	**45**	**105**	**180**	**15**	**92**	**437**

LEVEL 3 – 15 Weeks

COURSE NUMBER	COURSE TITLE	Hours					
		Theory		Lab		Field / Clinical	Total Hours
		In class	Online	In class	Online		
MFG8513	Manufacturing Application Theory II	30	15				45
MFG8514	Manufacturing Application II			75			75
ELN8613	Basic Electronic Assembly			30			30
ENL1819T	Reporting Technical Information	45	15				60
ENG8512	Sustainability in Engineering	30	15				45
GEN1001	Ethics: What's the Big Deal?		45				45
WEL9107	Welding - Oxyacetylene and Arc			45			45
	TOTAL LEVEL HOURS	**105**	**90**	**150**			**345**

LEVEL 4 – 15 Weeks

COURSE NUMBER	COURSE TITLE	Hours					
		Theory		Lab		Field / Clinical	Total Hours
		In class	Online	In class	Online		
CAM8502	Computer-Aided Manufacturing – Theory	30					30
CAM8506	Computer-Aided Manufacturing – Lab			60			60
MFG8515	Fluids and Hydraulics		15	30			45
CAD8512	Computer-Aided Design			30			30
MFG8516	Manufacturing Automation		15	30			45
ENG8306	Materials Science	45					45
GEDxxxx	General Education Elective		45				45
	TOTAL LEVEL HOURS	**75**	**75**	**150**			**300**

Diploma Program Total Hours: **1442**

Manufacturing Engineering Technician

Ontario College Diploma

Cash Flow Analysis

TOTAL ENROLMENT	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Year 1**	76	140	140	140	140	140
Tuition Fee per Semester	1,291	1,317	1,343	1,370	1,397	1,425
REVENUE						
Fees	98,116	184,355	188,042	191,803	195,639	199,552
Grant*			121,617	346,345	571,072	674,183
Flowthrough***	-51,587	199,586	190,357	123,549	43,471	0
Total Revenue	46,529	383,941	500,016	661,697	810,182	873,735
EXPENSES						
FT Academic + Fringe (22.46%)	223,548	406,299	406,299	406,299	406,299	406,299
Temp Acad + Fringe (9%)	23,686	61,584	61,584	61,584	61,584	61,584
FT Supp + Fringe (27.07%)	26,386	52,773	52,773	52,773	52,773	52,773
Temp Supp + Fringe (10%)						
Operating	17,500	18,375	19,294	20,258	21,271	22,335
Total Expenses	291,120	539,031	539,950	540,914	541,927	542,991
CONTRIBUTION BEFORE	**-244,591**	**-155,090**	**-39,934**	**120,783**	**268,255**	**330,744**
INVESTMENTS						
Equipment	0	50,000	100,000	50,000	50,000	0
Course Development	30,000	0	0	0	0	0
Renovations	0	0	0	0	0	0
Total Capital	30,000	50,000	100,000	50,000	50,000	0
NET CONTRIBUTION	**-274,591**	**-205,090**	**-139,934**	**70,783**	**218,255**	**330,744**
%	**-590.15%**	**-53.42%**	**-27.99%**	**10.70%**	**26.94%**	**37.85%**

* Grant Value $ 4,358

Program Weight 1.3, Funding Unit 2.8 (based on similar programs)

FT represents 2.0 professors in first year and 3.5 professors thereafter

A number of variables are considered when calculating tuition and expenses; these are changed based on government direction as required

Note:

The purpose of the Cash Flow Analysis for a new program is to capture the direct revenues and expenses associated with the program. The resulting contribution indicates the funds the program will generate to help support the current operations of the Academic Area. Therefore, pre-existing costs such as department overheads and space costs are not included in the cash flow. These costs are captured in the annual Program Costing exercise.

**Enrolment Detail

Level 01	40	40	40	40	40	40
Level 02	36	36	36	36	36	36
Level 03		34	34	34	34	34
Level 04		30	30	30	30	30
	76	140	140	140	140	140

Flowthrough from Suspended Program***						
Grant	164,885	199,586	190,357	123,549	43,471	0
Tuition	47,257					
Expenses	263,729					
Net Contribution	-51,587	199,586	190,357	123,549	43,471	0

As SPSP recommendations are implemented, new programs to replace phase-out programs, will be presented for approval. Often, full-time faculty will be re-assigned to the new program from the phase-out program. The allocation of full-time salaries to the first year of the new program causes significant strain on the reported financial contribution since the grant revenue is not recognised in the first years of the program's delivery.

To compensate, the cash flow recognizes the grant revenue, which continues to flow for a number of years after a program is suspended. Also included are tuition revenue and associatied costs for any "teach-out" that may be required for remaining students in Year 2 or beyond, of the phase-out program.