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PROGRAM REVIEW REPORT

on the

ENGINEERING DESIGN & DRAFTING TECHNOLOGY DIPLOMA PROGRAM

JUNE 1997

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SUMMARY

This is the second review of the EDDT (formerly Computer Aided Design & Drafting) program, the first review having been conducted in 1991. Events overtook many of the recommendations from the first review, and fewer than 20% of those recommendations aimed at the EDDT/CADD department were carried out. Clearly the department is wrestling with the same issues as it was six years ago. It is the Evaluation Committee's hope that this review will provide the EDDT department with the impetus required to move forward to positive change.

Curriculum is an area requiring improvement. Student workload continues to be excessive - in the region of 32-35 hours class time per week. Reconstruction of a more appropriate curriculum should alleviate some of the workload. Other recommendations include reducing the volume and magnitude of projects, revising the Math component to meet the needs of the anticipated Technologist level accreditation and scheduling English 110/111 and Math 114/124 parallel with EDDT courses to allow students the opportunity to gain transfer credit.

Many students expressed an interest in offering EDDT as a Co-op program to enable them to gain work experience before graduating. While this is not feasible due to budget restrictions, the Committee recommends the EDDT department explore the possibility of offering a practicum at some point in the program.

Further to the aforementioned changes, the Committee recommends that EDDT work closely with the Public Relations department to better publicize the revised program to potential students.

Other issues such as lack of communication within, as well as between, the EDDT department and the Trades and Technology Division were identified as problems. These can be alleviated by the regular scheduling of divisional meetings at times when all departments can attend, and similarly scheduling departmental meetings when all members are available.

Other program changes, such as a revamped Program Advisory Committee, a strengthened network of communication with employers, and better utilization of faculty professional development opportunities will all result in a more efficient and productive EDDT program.

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ENGINEERING DESIGN & DRAFTING TECHNOLOGY PROGRAM REVIEW

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ENGINEERING DESIGN & DRAFTING TECHNOLOGY

EVALUATION COMMITTEE MEMBERS

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1997 EDDT PROGRAM REVIEW CHRONOLOGY

The review of the Engineering Design and Drafting Technology Diploma (EDDT) Program was begun on December 17, 1996. A planning meeting between the EDDT faculty, Alastair Watt (Associate Director, Institutional Research and Planning) and Heather Shand (Research Analyst, Institutional Research and Planning) was held at that time to discuss program review procedures and questionnaire design, with further meetings held on January 10 and 17 to refine and finalize the questionnaire design.

Using student lists generated from Colleague (UCC's student information system), the Office of Institutional Research and Planning sent questionnaires to former EDDT students on January 24, 1997. Advisory committee and employer surveys (with lists obtained from the program faculty) were mailed on January 29 and February 6 respectively and EDDT faculty surveys were sent out on January 30, 1997.

A second mailing was initiated on February 13, 1997 and sent to former students, members of the advisory committee and employers who had not returned their questionnaire to date. Telephone communication commenced on March 4 & 5, 1997, contacting non-responding former students until March 6. Employers and members of the advisory committee were similarly contacted between March 12 - 14, 1997.

Current EDDT students at the first and second year levels were surveyed on February 27 and March 5, 1997. The cut-off date for all responses was April 15, and the Engineering Design and Drafting Evaluation Committee met on May 15 & 16 to analyze the data and formulate its report on the program.

PROGRAM BACKGROUND, OUTLINE AND OBJECTIVES

History of the Program:

1. General Drafting Program (1972 - 1982)

A ten-month vocational drafting program involving architectural, civil (including modules in basic technical math and surveying), piping, mechanical and structural drafting. Courses were scheduled in dedicated blocks of three, four, five, or six weeks in duration, depending on the length needed for each discipline. Student/instructors' contact hours followed the vocational requirements at the time - 30 hours per week.

Enrolment consisted of 18 students in each of two sections. One section ran from September to June; the other from March to December.

There were two full-time instructors, each responsible for a discipline within and two disciplines outside his background experience.

2. Computer Aided Design and Drafting (1981 - 82)

The real beginning of CADD at Cariboo College took place in September 1981. At start-up, this program was totally separate from the existing General Drafting Program and was handled entirely by the Mathematics and Drafting Department.

In its first year, the curriculum consisted of various computing courses, linear math, calculus, physics, technical writing, and a course in introductory board drafting.

There were no CADD stations at Cariboo College that year. The concept of "CADD" had yet to be defined. The following year would see the merging of General Drafting and CADD; the need to study design and drafting disciplines had finally been recognized. Along with this change came the acquisition of two (soon to be defunct) "Omnitech" CADD workstations.

3. General Drafting and Computer Aided Drafting Technology Program (1982 - 86)

The new program curriculum was developed by the two General Drafting instructors, and while retaining many of the academic characteristics of the original 1981 - 82 program, it was modeled largely after the Drafting Technology programs at NAIT and SAIT.

The change to computer aided drafting made this the first program of its kind in Western Canada. The first year retained its "vocational" status; the second year was added as "career-tech".

The first year was similar to the original vocational program, but with the added academic service courses in English, math, physics and computing, as well as discipline specific courses in electrical design and drafting, specifications, estimating and an expanded surveying practicum. The first year was partially semesterized, with several certificate-level civil and mechanical drafting courses offered in the Spring Term. The second year involved more advanced levels of the disciplines, as well as studies in engineering design (statics and strength of materials, hydraulics and hydrology, and mechanical design). Students had the option of completing an "extended" first year to receive a drafting certificate, or returning to complete second year for a two-year diploma.

With only two CADD stations in the beginning, the first year was strictly on the board, while second year students were booked on the computers from 7:00am to midnight every day of the week. Students with a drafting certificate had no CADD experience whatsoever. Due to frequent employers' preferences of 2-year over 1-year graduates, many students with certificates returned to complete the second year.

Starting with three full-time instructors in 1982, the faculty was increased to four the following year due to program diversity and workload requirements.

4. Computer Aided Drafting Technology Program (1986 - 97):

With declining demand for first year certificate graduates, General Drafting and CADD Technology was changed to a two-year, fully semesterized "technology" program. The entire program was revised to the "career-tech" model, which allowed for more continuity from the first year to the second, as well as more balanced instructional responsibilities.

Following numerous years of frustrating, user-unfriendly, primitive CADD software, a fledgling "AutoCAD" software was acquired in 1986, giving rise to expanded CADD instruction in AutoLISP Programming and Solids Modeling.

As the program was becoming more sophisticated, serious thought was given to "technologist" accreditation with the Applied Science Technologists and Technicians of BC (ASTTBC). In this quest, courses in steel and timber design and fluids mechanics were added to bolster the design aspect of the program. MATH 164 (Calculus I) was increased from four to five hours per week.

Application to the ASTTBC resulted in ("high level") technician accreditation in two areas: civil and mechanical.

The 1991 Program Review identified the extremely heavy student workload caused largely by the diversity and content level in the program. In answer to this, the concept of "streaming" was developed in 1991. This proposal was to reduce student workload, allow specialization and retain all existing disciplines (while adding others, such as plumbing design and drafting, HVAC design and steel detailing). This proposal received EPPR approval in principle, but was neither refined nor implemented.

Changes to the program between 1993 and 1997 were generally "house-keeping" in nature, with the exception of the replacement of Piping with Building Services. COMP 255 (Computer Graphics) was replaced with CTEC 280 (Basic PC System Maintenance), MATH 254 (Linear Math) was replaced with BUAD 100 (Introduction to Small Business Management for Applied Technologists), and responsibility for COMP 155 (Computing 1) was moved from the Computing Department to CADD (a budgetary issue as yet unresolved by the EPPR, but in full swing!) This year, admission requirements were changed to include Communications 12 (as an alternative to English 12), and to Math 11 (C+ grade minimum) from Math 12 (C grade minimum) in order to become more competitive with other comparable programs.

5. Engineering Design and Drafting Technology Program (1997)

The program was due for accreditation renewal with ASCTTBC in March 1996. Along with civil and mechanical technician, application was made for "building technologist" accreditation. In this process, it became clear that the name of the program was misleading and detrimental, projecting an image of a two-year study in AutoCAD software.

Even faculty and administrators within the UCC community did not fully understand the nature of the CADD Technology program. To the accreditation body, CADD is not a technology, but a tool. The new name "Engineering Design and Drafting Technology" was adopted in January, 1997.

Program Outline:

Computer aided design and drafting systems and workstations are becoming the rule rather than the exception in engineering offices throughout Canada and opportunities are increasing for technologists capable of using these new design tools effectively. The Engineering Design & Drafting Technology program (formerly Computer Aided Design & Drafting) at UCC provides a challenging design and drafting program with generous hands-on experience using state-of-the-art computer aided drafting and design workstations. Extensive training is also provided in conventional drafting so that the graduate is prepared fully to meet the high expectations of a changing design-drafting industry.

In the first year, both conventional drafting skills and computer aided drafting procedures are introduced. Manual drafting theory, standards and conventions form the basis for subsequent computer aided drafting operations and projects. Students use networked CADD workstations using the latest release of AutoCAD software to develop their computer aided drafting skills. Additional studies in mathematics, physics, technical communications and materials of construction are also completed in preparation for later courses in engineering design. Following final examinations in April, students undertake a three week practicum in Applied Surveying.

The second year of the program emphasizes the design process as applied to architectural, civil, electrical, mechanical, and structural engineering fields. These courses are carried out within an integrated design office environment where the emphasis is on design skills and computer aided drafting operations and management. During the final year, the students develop expert skills in the customization of AutoCAD software and develop a sound understanding of a networked microcomputer system, including installation and configuration methods and procedures. Manual design and drafting skills are maintained. Second year courses in statics, strength of materials, fluid mechanics, solids modeling, mechanical design, electrical design, steel design, wood design, AutoLISP programming, computer programming and small business management complete the requirements for graduation. The program is accredited at technician level with the Applied Science Technologists and Technicians of British Columbia.

Objectives:

The widespread use of CADD in the architectural and engineering community has created a demand for technical support staff with a high level of design and drafting skills. Computer aided drafting software is rapidly becoming more sophisticated, which is creating a demand for CAD software users who are trained in design skills. UCC's EDDT program has been developed to fulfill this need.

Specifically, the program has been developed with the following objectives:

- a) Graduates should have a sound background in the fundamentals of drafting. Although CADD is becoming predominant throughout the industry, architectural and engineering technologists should be conversant with both sketching and board drafting techniques.

Specifically, graduates should have a sound knowledge of orthographic projection techniques and the application of descriptive geometry to graphical design. Graduates should have a well developed sense of three dimensional visualization.

- b) Graduates should be competent operators of at least one CADD software and should be familiar with computer applications in engineering design and the integration of design and drafting software. CADD technologists should have some computer programming skills and should also have a knowledge of various computer operating systems.

Specifically, graduates should be very familiar with "AutoCAD" software, having had several hundred hours of hands on experience. They will also be knowledgeable in advanced techniques such as 3-D surface modeling and rendering, menu customization and "AutoLISP" programming. Graduates will also be familiar with problem solving and design software, specifically "TK Solver", "Pframe" and "Woods".

Graduates will be familiar with operating in the PC DOS and Windows environments.

- c) Graduates should have the mathematical and applied science skills which will enable them to perform design tasks at a competent level. Their background and training in these fields should give them the tools with which to keep abreast of today's rapidly changing technology.

Graduates should be able to apply mathematical concepts to the analysis and solution of technical problems. Specifically, they should be able to apply their knowledge of Algebra, Trigonometry, Calculus and Linear Algebra to problems in analysis and design.

Graduates should have a sound background in applied science and should be able to apply these skills to the solution of technical problems. Specifically, students will have a good understanding of the principles of statics, dynamics, strength of materials, and fluid mechanics. Students will also have been introduced to structural analysis and to electrical and electronic theory. Students will be able to apply this knowledge in mechanical design, and civil and structural design.

- d) Graduates should be knowledgeable in a particular discipline rather than being trained only in drafting or in computers.

Graduates are currently receiving training in six disciplines: Architectural, Building Services, Civil, Structural, Mechanical and Electrical. The general nature of the program, although limiting the depth of training in any one discipline, serves the needs of a smaller community and must to a certain extent provide the means by which students can enter this field in the discipline of their choice. Some employers have also indicated that the multi-disciplinary approach has some benefits, particularly when relating between the various disciplines.

We are again examining the feasibility of dividing the program into two options. The structure would involve "core" courses of math, English, physics, basic CADD, basic drafting and architectural drafting (which would satisfy the requirements outlined by the B.C. Common Core Blueprint for Drafting Programs). Courses would consist of architectural and civil design and drafting courses in the "Civil" option, and electrical and mechanical design and drafting courses in the "Mechanical" option. Structural and building services would be common to both options in varying degrees. This would provide much more specialization than our current program can allow. As a goal, the revised program would grant diplomas in Civil, Mechanical, Building and Building Services Technologies.

Each option would include design courses appropriate to the area of specialization. It is felt that with proper course structuring, this degree of specialization would allow these programs to be accredited at the technologist level as Civil, Mechanical, Building and Building Services Technologies. It is anticipated that the options be implemented in the Fall of 1997, beginning with a transition program for second year students.

ADMISSIONS DATA AND PERFORMANCE STATISTICS

Admissions Requirements:

Educational Requirements

- 1) BC Grade 12 or equivalent;
- 2) BC Math 11, or MATH 051 or equivalent with C+ grade minimum;
- 3) BC Physics 11 or PHYS 050 or equivalent;
- 4) 67% on the combined English 12 and Government Exam (within the last 5 years)
OR Level 3 on the composition section of the LANGUAGE PROFICIENCY INDEX (within the last 2 years);
OR completion of B.C. Communications 12 with C+ grade minimum;
OR completion of English 050;
OR completion of CESL 047 and 048 with C+ (Level 4) or better.

Promotion Policy

Admission to the second year of the program is granted to students who have successfully completed all first year courses and have achieved a GPA of 3.0 or better in drafting courses, including SURV 199 and a GPA of 2.33 in all other courses.

Graduation from the second year of the program is granted to students who have achieved a GPA of 3.0 in all drafting courses and a GPA of 2.0 in all other courses.

Program Capacity:

The EDDT program is funded for 72.0 FTE's (Full-time equivalents) per annum. The distribution of FTE's is usually 42.0 FTE's at first year level and 30.0 FTE's at second year.

Program Demand*:

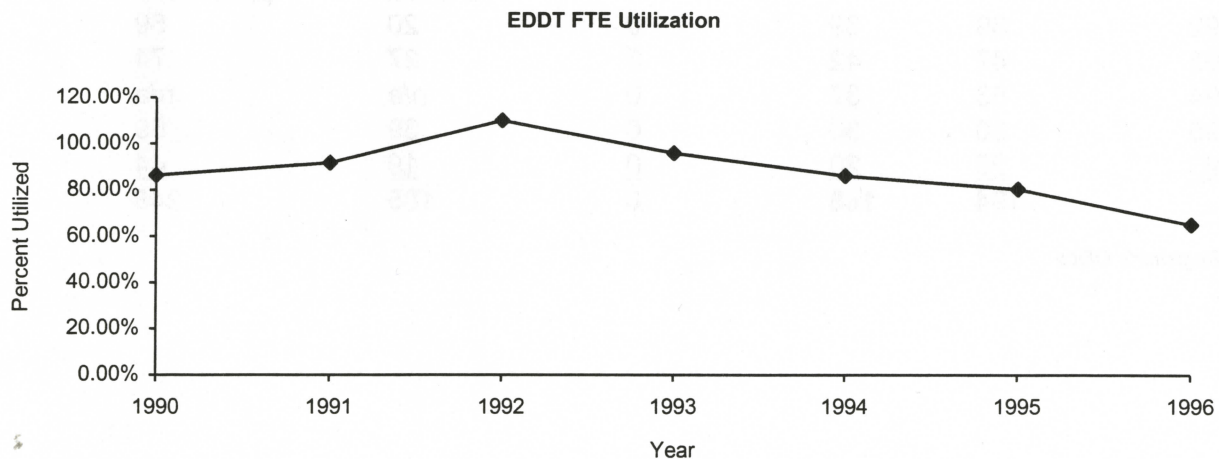
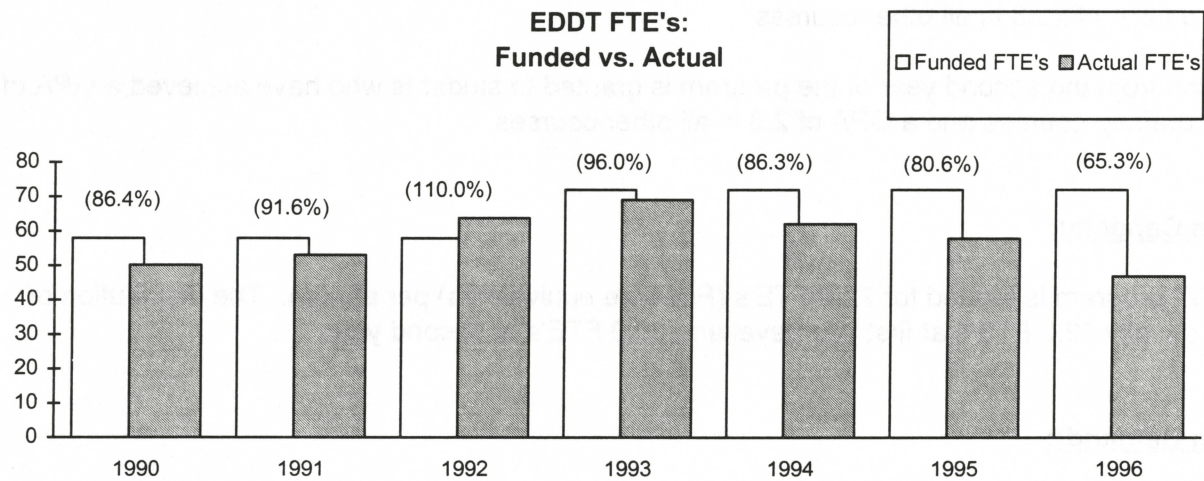
	Admitted	Enrolled	Wait listed	Incomplete/ Denied	Total Applications
Sept 1992	39	39	0	20	59
Sept 1993	47	42	0	27	74
Sept 1994	53	37	0	n/a	n/a
Sept 1995	30	30	0	39	69
<u>Sept 1996</u>	<u>25</u>	<u>20</u>	<u>0</u>	<u>19</u>	<u>44</u>
Totals:	194	168	0	105	246

* Source: Registrar's Office

EDDT Utilization Rates: 1990-1996

	1990	1991	1992	1993	1994	1995	1996
Funded FTE:	58.0	58.0	58.0	72.0	72.0	72.0	72.0
Actual FTE:	50.1	53.1	63.8	69.1	62.1	58.0	47.0
Utilization Rate:	86.4%	91.6%	110%	96.0%	86.3%	80.6%	65.3%

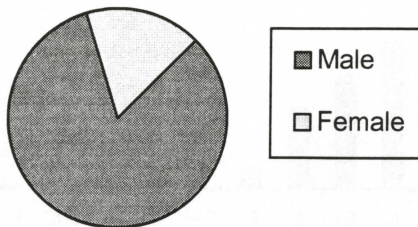
"Program utilization rate" is the number of actual registrations divided by the number of funded seats. The Ministry of Education, Skills and Training sets great store in utilization rates as measures of efficiency.



Gender Ratio:

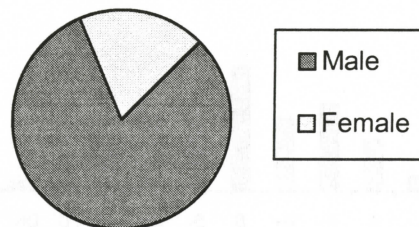
1993-1996 EDDT Program Intakes:

Female	19	17%
Male	92	83%
Total:	111	100%



1993-1996 EDDT Program Graduates:

Female	16	19%
Male	69	81%
Total:	85	100%



COMPLETION RATES:

Year 1 Intake

1990	1991	1992	1993	1994	1995	1996
36	30	39	42	43*	35**	20

1992	1993	1994	1995	1996	1997
14	16	21	21	27	18
38.9%	53.3%	53.8%	50.0%	62.8%	51.4%

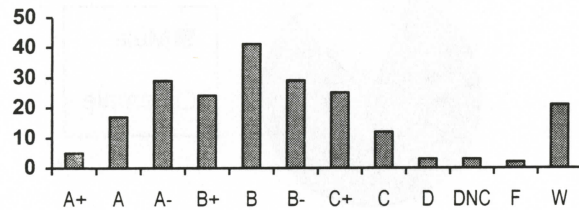
Completion Rate

* includes 6 students from the 1993 intake who graduated in 1996 with the 1994 cohort.

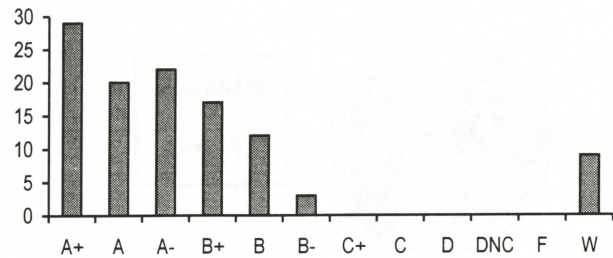
** includes 5 students from the 1994 intake who graduated in 1997 with the 1995 cohort.

**GRADE DISTRIBUTION: SELECTED COURSES, EDDT PROGRAM
93/FA through 96/WI**

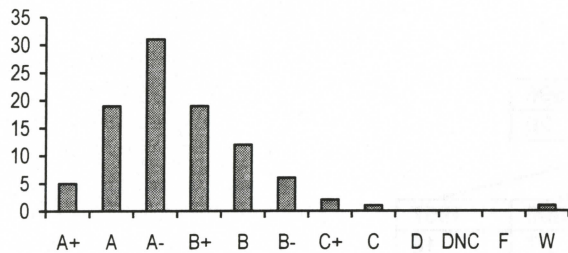
ENGL 155 - Technical Writing 1



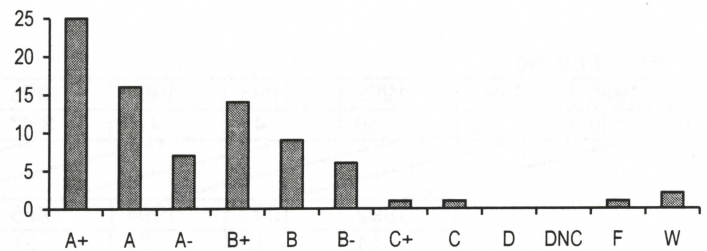
TECH 152 - Materials - Specifications



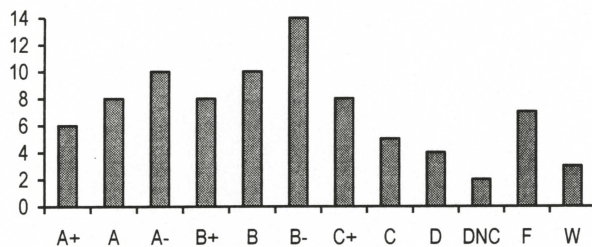
DRAF 157 - Architectural Drafting & Design



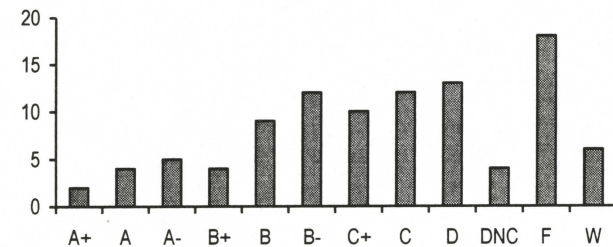
DRAF 271 - Advanced CADD



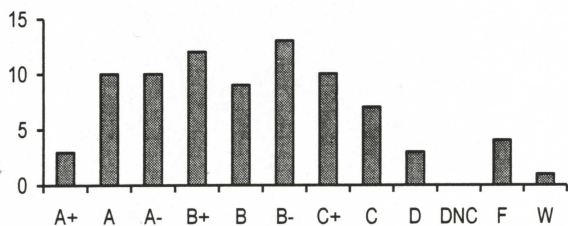
COMP 155 - Computing 1



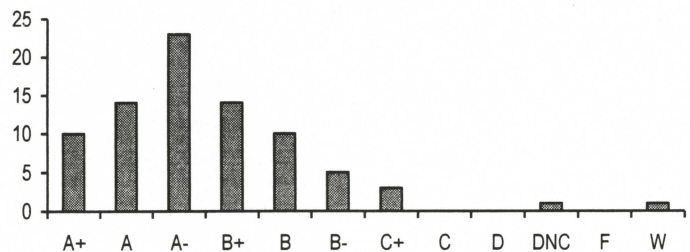
MATH 164 - Calculus 1



DRAF 270 - AutoLISP Programming



DRAF 257 - Architectural Drafting & Design 2



EMPLOYMENT PROSPECTS

(Source: *Job Futures - Volume 1 - Occupational Outlooks*)

At Work

People in this occupation work in consulting and construction companies, in utility, resource and manufacturing companies, in all levels of government and in a wide range of other organizations.

- Drafting technologists develop and prepare engineering designs and drawings from sketches, engineering calculations, specification sheets and other data. They may write technical reports, submit construction specifications, costs and materials estimates, and prepare contracts and tender documents.
- Drafting technicians plan and prepare engineering drawings, plans, diagrams and layouts.
- They may work independently, in teams with engineers from many disciplines, or as support staff for engineers, architects and industrial designers.

Education, Training and Experience

- Drafting technicians usually complete either a one-to-two-year college program in drafting, or a four-year apprenticeship training in drafting, or a combination of four-to-five years' related work experience and college or industry courses in drafting.
- If they wish, draftspersons may obtain certificates of qualification from provincial apprenticeship authorities.
- Some employers require drafting technologists and technicians to obtain certification in engineering design and drafting technology or in a related field through provincial associations.
- This certification requires a period of supervised work experience, usually two years.
- With additional education or experience, they may specialize in civil, mechanical, electrical or other engineering design techniques.

About this occupation

28,000 workers were employed in this occupation in 1994 - unchanged since 1984. Over the same period, employment grew by 17% economy-wide.

- 95% work full-time.
- The percentage of women in this occupation is approximately half the average of all occupations.
- The age distribution of workers in this occupations is similar to the overall work force.
- The unemployment rate is somewhat lower than the national rate.
- Full-time earnings are above the average of all occupations.
- Employment fluctuates with business conditions but is not seasonal.

Current labour market conditions in this occupation are fairly good despite weaknesses remaining from the 1991-2 recession.

Work Prospects

Labour market conditions are predicted to remain stable in this group over the 1995 to 2000 period.

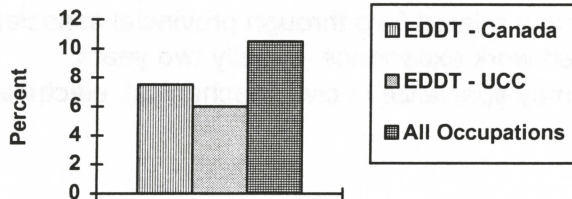
*****1997 SURVEY OF UCC EMPLOYERS CORROBORATES THIS PREDICTION.**

Looking to the Year 2000

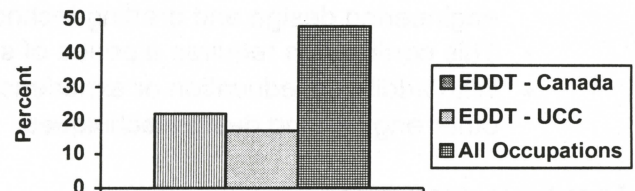
Labour market conditions in this occupation are expected to remain fairly good through the year 2000.

- There may be relatively few large-scale commercial and governmental design projects over the next five years. Most of the work in this field may be in maintaining existing buildings, home renovations and small-products designs.
- Rapid diffusion of computer-aided design technology will increase skill requirements in this occupation.
- Professional business services, the largest employing industry for this occupation, are expected to be the source of most of the job growth over the next five years. Construction, electrical and electronic products and machinery are also expected to make a significant contribution to growth.

Unemployment Rates



% of Women



STUDENT OUTCOMES DATA

STUDENT OUTCOMES DATA: Two year average: 1994-95		UCC N=40	Provincial N=117																			
LENGTH OF JOB SEARCH:		UCC	Provincial	<table><tr><th>Category</th><th>UCC (%)</th><th>Provincial (%)</th></tr><tr><td>Already had a job</td><td>0</td><td>7</td></tr><tr><td>Less than 1 month</td><td>5</td><td>17</td></tr><tr><td>1 to 3 months</td><td>23</td><td>19</td></tr><tr><td>4 to 5 months</td><td>55</td><td>31</td></tr><tr><td>More than 5 months</td><td>18</td><td>26</td></tr></table>	Category	UCC (%)	Provincial (%)	Already had a job	0	7	Less than 1 month	5	17	1 to 3 months	23	19	4 to 5 months	55	31	More than 5 months	18	26
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EMPLOYMENT OUTCOMES:		UCC	Provincial	<table><tr><th>Category</th><th>UCC (%)</th><th>Provincial (%)</th></tr><tr><td>Empl. F/T Training Related</td><td>70</td><td>69</td></tr><tr><td>Empl. F/T Non-Training Related</td><td>18</td><td>14</td></tr><tr><td>Empl. Part-Time</td><td>6</td><td>5</td></tr><tr><td>Unemployed</td><td>6</td><td>12</td></tr></table>	Category	UCC (%)	Provincial (%)	Empl. F/T Training Related	70	69	Empl. F/T Non-Training Related	18	14	Empl. Part-Time	6	5	Unemployed	6	12			
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Empl. F/T Non-Training Related	18%	14%																				
Empl. Part-Time	6%	5%																				
Unemployed	6%	12%																				
% employed in a Permanent Job	63%	51%																				
% employed in a Training Related Job	73%	64%																				
Gross median monthly salary	\$ 2,080	\$ 2,270																				
VALUE OF STUDIES TO EMPLOYMENT: ...extent to which type of work as expected:		UCC	Provincial	<table><tr><th>Category</th><th>UCC (%)</th><th>Provincial (%)</th></tr><tr><td>Exactly</td><td>24</td><td>33</td></tr><tr><td>Somewhat</td><td>65</td><td>64</td></tr><tr><td>Not at All</td><td>12</td><td>8</td></tr></table>	Category	UCC (%)	Provincial (%)	Exactly	24	33	Somewhat	65	64	Not at All	12	8						
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USEFULNESS OF TRAINING: ...in getting job:		UCC	Provincial	<table><tr><th>Category</th><th>UCC (%)</th><th>Provincial (%)</th></tr><tr><td>Very</td><td>55</td><td>64</td></tr><tr><td>Somewhat</td><td>33</td><td>21</td></tr><tr><td>Not Really</td><td>5</td><td>5</td></tr><tr><td>Not at All</td><td>8</td><td>10</td></tr></table>	Category	UCC (%)	Provincial (%)	Very	55	64	Somewhat	33	21	Not Really	5	5	Not at All	8	10			
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Somewhat	33	21																				
Not Really	5	5																				
Not at All	8	10																				
Very	55%	64%																				
Somewhat	33%	21%																				
Not Really	5%	5%																				
Not at All	8%	10%																				
...in performing job:		UCC	Provincial	<table><tr><th>Category</th><th>UCC (%)</th><th>Provincial (%)</th></tr><tr><td>Very</td><td>35</td><td>47</td></tr><tr><td>Somewhat</td><td>55</td><td>38</td></tr><tr><td>Not Really</td><td>0</td><td>3</td></tr><tr><td>Not at All</td><td>10</td><td>12</td></tr></table>	Category	UCC (%)	Provincial (%)	Very	35	47	Somewhat	55	38	Not Really	0	3	Not at All	10	12			
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Category	UCC (%)	Provincial (%)																				
Very	40	47																				
Somewhat	58	50																				
Not Really	2	4																				
Not at All	0	0																				
Very	40%	47%																				
Somewhat	58%	50%																				
Not Really	2%	4%																				
Not at All	0%	0%																				

This information was obtained from the 1994 and 1995 Student Outcomes survey conducted by UCC and the Ministry of Education, Skills and Training.

TABULAR SUMMARY OF QUESTIONNAIRE RESPONSES
ENGINEERING DESIGN & DRAFTING TECHNOLOGY DIPLOMA PROGRAM REVIEW

The categories and quantities of responses are tabled below:

<u>Recipient</u>	<u># Sent</u>	<u># Completed & Returned</u>	<u>% Returned</u>
Employer:	45	28	62%
Advisory:	10	9	90%
Faculty:	10	9	90%
Students:			
Current	47	38	81%
Former	121	48	40%
TOTAL	233	132	57%

Former Students:

Returned by Post Office: 15

Non-Respondents: 58

SUMMARY OF QUESTIONNAIRE RESPONSES

1. Former Students

Of the 48 former students who responded, 50% were in the age range 18-24, 25% were between 25-29, 17% were in the 30-39 age group, and 8% were 40 or older. Of these students, 50% entered the program with Grade 12 level education, while 40% had some college, 6% had a college diploma and 4% held a degree. Eighty-three percent of respondents successfully graduated from the EDDT program, and 35% have gone on to further studies. The two main job destinations for EDDT graduates were in the fields of Architecture (23%) and Civil (23%).

Of the 42 students who are currently employed, 83% are in jobs relating to their studies at UCC. When asked to evaluate the skills and behaviours learned in the program on a four point scale, with 4.0 meaning "To a Great Extent", 3.0 meaning "To Some Extent", 2.0 meaning "A Little" and 1.0 meaning "Not at All", students gave high ratings in respect to emphasis placed on the following categories: math and computation skills (3.50), theoretical knowledge and understanding (3.15), technical knowledge and expertise (3.13), ability to work independently (3.15), team work (3.27), quality of work (3.26), good work habits (3.11) and CADD/computing skills (3.69). Skills perceived to be receiving less emphasis include client/consultant relations (1.85) and administration skills (1.75).

In the written comments section, students identified common strengths, weaknesses, and possible significant changes in the program. Strengths identified include a strong job market, computer courses, AutoCAD skills and high quality computers. Students felt the program was not long enough - that they were learning too much too quickly. Some also indicated that math was too intense, courses lack transferability and specialization, and the lack of 'real world experience' was a drawback.

Changes suggested include lengthening the EDDT program to 3 years, allowing specialization, adding a co-op option, and improving the integration of courses with each other.

2. Current Students:

First and second year students responded to questionnaires in a similar manner. Both groups gave high marks to the emphasis placed on math and computation skills, theoretical and technical knowledge, ability to work both independently and in a team, productivity, quality of work, and CADD/computing skills. They gave lower marks to the emphasis on items such as initiative, client/consultant relations and administrative skills. In the items where they differed, the first year students almost consistently gave higher ratings than did second year students: written communication skills (3.33 vs 2.25), oral communication skills (3.06 vs 2.15) and good work habits (3.22 vs 2.75). Second year students rated problem solving skills higher than the first year students (3.25 vs 2.67).

When asked questions about program content, procedures and resources, first year students gave much higher ratings than their second year counterparts. Particularly low marks were given to adequacy of textbooks and workload by both groups: 50% of first year and 70% of second year recorded dissatisfaction regarding textbooks and 45% of first year and 65% of second year found the workload to be unsatisfactory.

Issues identified in written comments were similar to those of former students. While appreciating their knowledge of CADD and computer skills, students found problems with workload and the lack of opportunities for obtaining pre-graduation work experience.

3. Advisory Committee Survey:

Nine of ten Advisory Committee members responded to this survey; unfortunately, there was a surprisingly high occurrence of "Don't Know" responses, which raised concerns with the Evaluation Committee members.

The members felt the program's entrance requirements enable students to succeed in the program and that the program places significant emphasis on theoretical knowledge, technical skills, written and oral communications, team work, quality of work and CADD/computing skills. They felt the program lacks emphasis in the areas of math and computation skills, ability to work independently, problem solving skills, productivity, good work habits, ability to organize and take direction, and initiative. When asked their opinion about possible program streaming, 68% agree that the EDDT program should be streamed into the options of Architectural/Civil and Mechanical/Electrical.

Positive aspects of membership on the Advisory Committee included the ability to gain up to date information on professional practice needs and trends in the market place, and the chance for employers to see what graduates will have to offer as employees.

Suggested improvements include regular annual meetings, increased communication between the EDDT faculty and committee members, and having company principals attend meetings rather than delegates.

4. Employer Survey

Of the 28 employers who responded to the EDDT survey, 14 (50%) had hired UCC EDDT graduates. Strengths of graduates that employers noted were a thorough knowledge of CADD and AutoCAD, the ability to work independently, willingness to learn, and conscientiousness. Suggestions for improvement included knowledge of software programs other than AutoCAD, knowledge of basic office procedures and new technology, and basic drafting skills. Inability to see the 'overall picture', limited knowledge of specific disciplines and limited drafting skills were identified as deficiencies of graduates. Specific skills of graduates rated below employers' expectations included theoretical knowledge and understanding (25% below expectations), technical knowledge and expertise (21%), problem-solving skills (29%), productivity (work rate) (29%), ability to organize effectively (29%), initiative (29%), client/consultant relations (40%), and administrative skills (23%). Employers did find, however, that EDDT graduates' performance in areas such as math and computation skills, oral communication skills, willingness to take direction, ability to work independently and with others, quality of work and work habits either met or exceeded their expectations.

The employers feel that changing technologies and a broader knowledge of software must be addressed in the EDDT program in the next three to five years. Seventy nine percent agree that the program should be streamed into two options of Architectural/Civil and Mechanical/Electrical in order to offer more depth to the disciplines and 61% feel that the industry will require either more or the same number of graduates in the next five years.

5. Faculty Survey:

The EDDT faculty clearly are well aware of the issues troubling the program. They collectively identify the program diversity, the keenness of the faculty and the technical skills of graduates as strengths of the program. Limitations suggested include the broad spectrum of subjects required and the lack of accreditation at the technology level. Significant changes would include reducing the work load,

streaming program into options, and redesigning curriculum. Faculty feel the direction of the program in the next three to five years will be affected by the increasing need for technologists, more flexibility required by employers, and the use of the new information technologies such as distance education.

Faculty members were unhappy about the time lag between submitting manuals to Printing and Duplicating for printing and having those manuals available in the Bookstore. Some dissatisfaction was also expressed in regard to office space and secretarial and photocopying support. Although time is available in the summer for curriculum development, library resources are not available.

Under the heading of "Departmental Governance," faculty identified problems with the lack of regular meetings, lack of procedure, and the incohesiveness of the department.

A perception existed that first year EDDT does not prepare students adequately for second year; this perception was substantiated by the identification of content gaps in the curriculum. Even though faculty rated completion rates as satisfactory, the data on these indicate an average completion rate of 51.7% over the last six years, with rates as low as 38.9% in 1992.

STRENGTHS OF THE PROGRAM

The following strengths have been identified in the Engineering Design and Drafting Technology Program by the Evaluation Committee:

1) Graduate Employability:

Seventy-five percent of the respondents to the former student survey (N=48) have achieved employment on a full or part-time basis in their field.

2) Employer Validation:

Employers value graduates of the program, particularly their quality of work, ability to work with others, math and computational skills, oral communication, ability to work independently, work habits, and willingness to take direction. Employers indicate that graduates are particularly well prepared in AutoCAD. Clearly, the graduates of the program, through their job performance, are helping establish a good reputation for the EDDT Program.

3) Further Studies:

The fact that 35% of former student respondents have taken further courses or degree work attests to the solid foundation and work ethic instilled in them by this program.

4) Technologist Accreditation:

There is a strong desire among EDDT faculty to move toward provincial accreditation as a Technologist Program in Building while maintaining Technician standing in Civil and Mechanical with ASTTBC.

5) Well-Equipped Laboratories:

With the acquisition of twenty-six new Pentium computers (funds made available through Furniture, Fixtures and Equipment), EDDT grads will continue to enhance their competency in AutoCAD skills.

**AREAS OF EDDT PROGRAM
WHICH CAN BE IMPROVED (WITH RECOMMENDATIONS)**

The Evaluation Committee identified the following aspects of the EDDT program as being in need of improvement. Recommendations are prioritized.

1. Curriculum:

Data extracted from the student surveys indicate that the student workload continues to be excessive - in the region of 32-35 hours per week. The Committee recommends that student contact hours should be reduced to 30 hours per week, and encourages EDDT faculty to consider, if necessary, utilizing the third semester in each year of the program to accommodate the re-structured curriculum.

The Committee questions the appropriateness of some courses, course objectives and content, in light of the overall program goals and objectives. It reminds the EDDT faculty to bear in mind in their curricular deliberations that courses belong to the department, not the individual. It recommends:

- a) **that the EDDT Department construct a curriculum appropriate to the revised goals and objectives of meeting the requirements for accreditation in the following disciplines: Building Technologist through the ASTTBC, and, if resources allow, Civil Technician and Mechanical Technician;**

ACTION: EDDT faculty

- b) **the elimination of Computing 155 and Design 261 (part of whose content may be incorporated elsewhere in the program);**

ACTION: EDDT faculty

- c) **the elimination of CTEC 280 or the reduction of the time in this course to no more than two hours per week;**

ACTION: EDDT faculty

- d) **the elimination or reduction of Drafting and Design 183, 284 and 268, which do not contribute to Technologist/Technician accreditation;**

ACTION: EDDT faculty

- e) **the reduction of the number of drafting labs as well as the volume and magnitude of assigned projects;**

ACTION: EDDT faculty

- f) an increase in the design/theory content in the remaining courses designated as “EDDT”;

ACTION: EDDT faculty

- g) in co-operation with the Chair of Math and Statistics, the revision of Math 154 and 164 to meet the needs of the anticipated technologist accreditation and the new Math 11 prerequisites.

**ACTION: EDDT faculty;
Chair, Mathematics and Statistics**

Data from the student surveys indicate a problem with course transferability. To rectify this problem we recommend:

- h) that Math 154 and 164 be scheduled parallel with Math 114 and 124. This will allow qualified students access to university transfer Math;

**ACTION: EDDT faculty;
Chair, Mathematics and Statistics**

- i) that English 155 and 165 be scheduled parallel with English 110 and 111. This will allow qualified students access to university transfer English.

**ACTION: EDDT faculty;
Chair, English and Modern Languages**

Data gathered from all the surveys indicate a problem with students' acquisition of the following skills and values (Conference Board of Canada): good work habits, ability to organize effectively, willingness to take direction, initiative, and client/consultant relations. The Committee recommends:

- j) that skills and values listed above should be modeled and emphasized by EDDT instructors and incorporated into the course objectives;

ACTION: EDDT faculty

- k) that a skills and values record assessment be completed by students at the end of each course to encourage self-assessment and increase self-reliance in the acquisition of these skills and values.

ACTION: EDDT faculty

For continuation into second year, students require a GPA of 3.0 in all drafting courses and a minimum of 2.33 in all other courses. This seems to suggest to students that drafting courses are more important than other courses and may be contributing to the lower grades in other courses. The Committee recommends:

- l) that GPA requirements should be adjusted in all courses when EDDT courses are renamed and redesigned.**

ACTION: EDDT faculty

Student data indicate a problem with the text books in the EDDT Program. The Committee recommends:

- m) that industry code books be required, but that all other texts be cited as reference books unless the instructor deems otherwise.**

ACTION: EDDT faculty

2. Co-op:

Student survey responses indicate concern over a lack of experience in the field or a Co-op program in EDDT. In light of this, and due to the lack of funds available for a Co-op program, the Committee recommends:

- a) that the EDDT department, in conjunction with a revitalized Advisory Committee and an employers' group, explore the possibility of offering a practicum to students.**

ACTION: EDDT faculty

3. Promotion:

There is an indication that problems with promoting the program to potential students were a factor in the declining enrolment experienced by the EDDT program. The Committee therefore recommends:

- a) that the EDDT faculty work closely with the Public Relations Department to devise a process which will adequately publicize the revised program in a manner acceptable to all parties.**

ACTION: EDDT faculty

4. Divisional Liaison:

Concerns were expressed regarding the position of the EDDT department within the Trades and Technology Division. These arose at least partly due to differences in funding formulae, Collective Agreement, culture and attitude. The Committee recommends:

- a) that once the Fall EDDT timetables are in place, the Dean, Trades and Technology Division, in co-operation with the EDDT Chair, arrange to schedule divisional meetings at times when all EDDT faculty may attend.**

ACTION: Dean, Trades and Technology

Communication problems in the division are apparent and could be remedied by:

- b) regular divisional meetings to include all members;**

ACTION: Dean, Trades and Technology

- c) more dialogue, perhaps through e-mail or a monthly newsletter, in an attempt to keep all division members informed;**

ACTION: Dean, Trades and Technology

- d) informal liaison with other Trades and Technology faculty to create better bridges to inclusiveness within the division.**

ACTION: EDDT faculty

The Committee strongly supports the new direction proposed by the EDDT Program and urges the Trades and Technology Division to support and consciously promote appropriate attitudes to enable EDDT faculty to achieve their goal.

5. Departmental Governance:

Within the EDDT department it is clear that communications must be improved in order that each department member is able to express his/her opinions and have input into department decisions. The Committee recommends:

- a) that department meetings be held no less than once every two weeks at a time when all members can attend;**

ACTION: Chair, EDDT

- b) that the meetings be organized with a request for agenda items circulated in advance of the meeting;

ACTION: Chair, EDDT

- c) that minutes should be taken and circulated;

ACTION: Chair, EDDT

- d) that specific attribution of responsibility for actionable items be designated with a later follow up.

ACTION: Chair, EDDT

6. Advisory Committee:

From data gathered from both the employers and Advisory Committee, it is clear that the EDDT Advisory Committee needs to be strengthened. We recommend:

- a) that the EDDT Advisory Committee immediately be reconstructed and revitalized by the appointment of new members, including at least one graduate from the EDDT Program who has supervisory duties, and that the majority of the Committee be appointees with management/supervisory responsibilities;

**ACTION: Chair, EDDT;
Dean, Trades and Technology**

- b) that the EDDT Advisory Committee maintain and improve a network of communication with employers;

ACTION: EDDT Advisory Committee

- c) that communication be improved between the Advisory Committee and the EDDT faculty in order to increase involvement by the Advisory Committee. Suggestions for greater involvement include:

- newsletters;
- informal contact (telephone calls, invitations to lunch at UCC);
- extending invitations to Advisory Committee members to guest lecture to UCC students;
- inviting ideas from Advisory Committee members regarding directions of disciplines.

ACTION: EDDT faculty

7. Faculty:

Data from student surveys indicate concern with faculty members' currency in their disciplines as well as the quality of their instruction. The Committee recommends:

- a) that EDDT instructors be encouraged to upgrade or modernize their technical skills and qualifications where necessary, and that assistance be provided by UCC for departmental members to achieve this. Additionally, instructors should be encouraged to improve their teaching skills through in-service courses (e.g. Instructional Skills Workshops). These activities should be included in the Formative Evaluation reports to the department Chair and maintained as part of the instructor's permanent record.**

**ACTION: Chair, EDDT; EDDT faculty;
Dean, Trades and Technology;
Vice-President, Instruction**

Data gathered from student surveys indicate a problem in accessing instructors outside class time. The Committee recommends:

- b) that EDDT instructors establish times when they will be available for student contact, and that these times be posted and maintained so that students are aware of them.**

ACTION: EDDT Faculty

APPENDIX A

METHODOLOGY

The data were collected in the following ways:

- 1) Consultation took place with Paul Van Zand, Chairperson, EDDT & DAAD, John Dumesnil, Instructor, EDDT, Walter Prescott, Instructor, EDDT, and Dennis Oldridge, Instructor, EDDT, on the design of the questionnaires.
- 2) Questionnaires were administered to EDDT former students, employers, faculty, current students and Advisory Committee members. All data were processed using SPSS for Windows to achieve mean responses. Verbal comments for each group were recorded separately and anonymously.
- 3) "Descriptive Data" on the EDDT Program's objectives, course outlines, etc., were solicited from Paul Van Zand, Chairperson, EDDT & DAAD.
- 4) Data on annual FTE utilization, graduation rates, gender and grade distributions were provided by the Office of Institutional Research.
- 5) The following people associated with the program participated in the review process or were interviewed:
 - **Dennis Oldridge**, Instructor, Engineering Design and Drafting Technology;
 - **John Dumesnil**, Instructor, Engineering Design and Drafting Technology;
 - **Jim Totten**, Chair, Mathematics and Statistics;
 - **Nicole Helmer**, First year student, Engineering Design and Drafting Technology;
 - **Michael Ansell**, Second year student, Engineering Design and Drafting Technology.

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