QUEENSBOROUGH COMMUNITY COLLEGE

Department of Engineering Technology

Computer Engineering Technology

Criterion 3 - Student Outcomes (A-I)

Student outcomes describe what students are expected to know and be able to demonstrate by the time of graduation. They relate to the skills, knowledge, and behaviors that students acquire in their matriculation through the Computer Engineering Technology Program at Queensborough Community College. The Engineering Technology Department conducts regular assessment of student achievement of these outcomes via Performance Indicators. The results of the assessment process are recorded in the **Assessment Database** and tracked in the attached **Continuous Improvement Plan**. The Continuous Improvement Plan itself provides evidence of the ongoing review process used to evaluate the effectiveness of the Computer Engineering Technology Program at Queensborough and summarizes the course of action in response to specific assessment results.

Measurement of student success in attaining each outcome is implemented in a set of supporting **Performance Indicators**. Each Performance Indicator is assigned to a set of courses selected by the department assessment committee and proposed to the department for review and approval. For each Performance Indicator, faculty then select assignments in each course, develop rubrics and collect the student data to be recorded on each rubric.

The performance indicators to be demonstrated in each course are listed in the table below.

Student Outcome A - an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;

- **Performance Indicator ETCTa1** Analyze electrical, electronic and computer circuits and systems.

- **Performance Indicator ETCTa2** Construct electronic circuits from circuit schematics and logic diagrams using components on protoboard and PCB board.
- **Performance Indicator ETCTa3** Effectively utilize instrumentation equipment and measurement techniques for the building, testing, and operating of electronic circuits and systems.
- **Performance Indicator ETCTa4** Utilize computer programming skills and associated software such as circuit simulation software to solve applied problems.
- **Performance Indicator ETCTa5** Demonstrate knowledge of digital electronics theory and microcomputer architecture.
- **Performance Indicator ETCTa6** Produce printed circuit board layouts using application software and create professional level circuit boards.
- **Performance Indicator ETCTa7** Interpret relevant technical standards.

Student Outcome B - an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;

- **Performance Indicator ETCTb1** Utilize engineering principles to analyze and design analog circuits and systems including semiconductor devices, filters, and amplifiers.
- **Performance Indicator ETCTb2** Apply principles of digital logic in the design and analysis of digital circuits.
- **Performance Indicator ETCTb3** Apply microprocessor programming techniques to real world applications.
- **Performance Indicator ETCTb4** Utilize fabrication, assembly and troubleshooting techniques associated with the manufacturing and maintenance of electronic systems.
- **Performance Indicator CTb5** Apply Configuration, installation, and maintenance techniques to computer networks and operating systems.

Student Outcome C - an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;

- **Performance Indicator ETCTc1** Verify that a system is working correctly by taking measurements and interpreting the results.
- **Performance Indicator ETCTc2** Analyze discrepancies in experimental results and determine whether the error is within acceptable experimental limits.

Student Outcome D - an ability to function effectively as a member of a technical team;

- **Performance Indicator ETCTd1** Assign and perform shared duties to accomplish a common task.
- **Performance Indicator ETCTd2** Demonstrate an ability to communicate effectively with team members.

Student Outcome E - an ability to identify, analyze, and solve narrowly defined engineering technology problems;

- **Performance Indicator ETCTe1** Identify and apply circuit laws to analyze and implement electrical and electronic systems.
- **Performance Indicator ETCTe2** Analyze systems in a mathematical environment at or above the level of algebra and trigonometry.

Student Outcome F- an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;

- **Performance Indicator ETCTf1** Produce effective written documents including lab reports and term papers.
- **Performance Indicator ETCTf2** Deliver effective oral presentations.
- **Performance Indicator ETCTf3** Interpret visual and graphical information and explain data.

Student Outcome G - an understanding of the need for and an ability to engage in self-directed continuing professional development;

- **Performance Indicator ETCTg1** Engage in activities that encourage discovery based learning utilizing and interpreting information and citing of sources.
- **Performance Indicator ETCTg2** Attend presentations on topics relevant to professional development and participate in clubs and extracurricular activities.

Student Outcome H- an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity;

- **Performance Indicator ETCTh1** Identify ethical misbehavior or situations**,** and suggest professional courses of action.
- **Performance Indicator ETCTh2** Identify and report on points of view, customs, or beliefs held by a variety of stakeholders in a situation.

Student Outcome I - a commitment to quality, timeliness, and continuous improvement;

- **Performance Indicator ETCTi1** Fully complete projects in a timely manner, with attention to quality.
- **Performance Indicator ETCTi2** Revise written communications to improve quality.

Computer Engineering Technology Course Assignments for
Student Outcomes "A-I" and Supporting Performance Indicators "a-i"

COURSES	TITLE	OUTCOMES								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
ET-110	Electric Circuit Analysis I	a1 a4 a7		c2		e1				i1
ET-210	Electronics I	a1 a3	b1	c2		e1	f3			
ET-232	Wireless Mobile Communications	a7								
ET-350	Computer Control Systems	a1	b3	c1		e2				
ET-420	Computer Project Lab	a3 a6	b4						h1 h2	
ET-481	Upgrad. and Repair. PCs		b4							
TECH-100	Introduction to Engineering and Technology						f2 f3	g1 g2	h1 h2	
ET-502	Introduction to Computer Programming	a4					f1			
ET-504	Operating Systems & System Deployment		b5				f1			
ET-509	C++ Programming for Embedded Systems	a4	b3				f1 f2	g1		
ET-540	Digital Computer Theory I	a2 a4 a5	b2							i2
ET-542	Computer& Electrical Device Applications				d1 d2					
ET-560	Microprocessors	a2 a5	b2 b3				f2			i2
ET-575	Introduction to C++ Programming and Implementation	a4								i1

		a	b	c	d	e	f	g	h	i
ET-704	Networking Fundamentals I	a7	b5		d1 d2					i1
ET-705	Networking Fundamentals II	a7	b5		d1 d2					
ET-710	Web Technology I: Building and Maintaining Websites	a4								
ET-725	Computer Network Security	a7						g1		
	Engineering Technology Dept. sponsored talks and Clubs including Tau Alpha Pi, IEEE, Robotics, HAM Radio, Computer Gaming, Programming, New Media, Mechanical Technology, and Architecture Clubs							g2		
MA-114	College Algebra & Trig for Technical Students					e2				
MA-128	Calculus for Technical & Bus Students					e2				
PH-201	General Physics I					e2				
PH-202	General Physics II					e2				
SS or HI	Soc Sci or Hist. Elect								h2	
EN-101	English Composition I						f1			i2
EN-102	English Composition II						f1			i2
ST-100	Intro to College Life									i1

For associate degree programs, these student outcomes must include, but are not limited to, the following learned capabilities:

a. an ability to apply the knowledge, techniques, skills, and modern tools of the discipline to narrowly defined engineering technology activities;
b. an ability to apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require limited application of principles but extensive practical knowledge;
c. an ability to conduct standard tests and measurements, and to conduct, analyze, and interpret experiments;
d. an ability to function effectively as a member of a technical team;
e. an ability to identify, analyze, and solve narrowly defined engineering technology problems;

(Student Outcomes are continued on the next page)

Student Outcomes <u>Continued</u>:

f. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature;
g. an understanding of the need for and an ability to engage in self-directed continuing professional development;
h. an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity; and
i. a commitment to quality, timeliness, and continuous improvement.