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 CTa1** Analyze computer circuits and systems.
- **Performance Indicator CTa2** Construct computer circuits from circuit diagrams and logic schematics using components on breadboard and PCB board.
- **Performance Indicator ETCTa3** Use instrumentation equipment and effective measurement techniques for building, testing, and operating of electronic circuits and systems.
- **Performance Indicator ETCTa4** Use application software, circuit simulation software and computer programming skills to solve problems in electronic systems.
- **Performance Indicator ETCTa5** Demonstrate knowledge of digital electronics theory and microprocessor architecture.
- **Performance Indicator CTa6** Produce printed circuit board layouts using CAD software and create professional level digital circuit boards.

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** Apply scientific principles relating to semiconductor devices, filters, op-amps, and amplifier theory to the operation of electronic circuits.
- **Performance Indicator CTb2** Apply principles of digital logic in the design and analysis of computer and digital circuits.
- **Performance Indicator ETCTb3** Apply microprocessor programming techniques to real world applications.
- **Performance Indicator ETCTb4** Apply the design, fabrication, assembly and troubleshooting techniques associated with the manufacture and servicing of consumer electronic products.
- **Performance Indicator CTb5** Configure, install and troubleshoot 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 circuit 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** Develop and assign 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** Apply the basic laws of circuit analysis to electrical and electronic systems.
- **Performance Indicator ETCTe2** Analyze systems in a mathematical environment at or above the level of algebra and trigonometry.
- **Performance Indicator CTe3** Solve circuit problems relating to semiconductor devices, and op-amps.
- **Performance Indicator ETCTe4** Analyze and implement electronic and digital systems.
- **Performance Indicator CTe5** Design and use algorithms to create computer programs.

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 research and communication using information acquisition tools, and cite sources.
- **Performance Indicator ETCTg2** Attend department sponsored presentations on technical topics 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** Describe the interrelationships between technology, professional responsibilities, and contemporary society.
- **Performance Indicator ETCTh2** Identify ethical misbehavior or situations and suggest courses of action.
- **Performance Indicator ETCTh3** 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 technical reports and writing 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	a4		c1 c2		e1	f2			i1 i2
ET-140	Sinusoidal and Trans. Cir. Analysis	a3	b1	c2		e1 e2				i1
ET-210	Electronics I	a1 a4	b1	c2		e3 e1	f3			
ET-350	Computer Control Systems	a1 a3	b3	c1		e2 e3 e4				
ET-420	Computer Project Lab	a3 a6	b4	c1					h1 h2	
ET-481	Upgrad. and Repair. PCs		b4			e4				
ET-501	Computer Applications						f2 f3	g1	h1 h2 h3	
ET-502	Introduction to Computer Programming					e5	f1			
ET-504	Operating Systems & System Deployment		b5				f1			
ET-509	C++ Programming for Embedded Systems	a5	b3			e5	f2 f1	g1		
ET-540	Digital Computer Theory	a2 a4 a5	b2							i2
ET-542	Computer& Electrical Device Applications				d1 d2					
ET-560	Microprocessors	a2 a5	b2 b3				f1 f2			
ET-704	Networking Fundamentals I		b5		d1 d2					

	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								h3	
EN-101	English Composition I						f1			
EN-102	English Composition II						f1			
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;
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.