

QUEENSBOROUGH COMMUNITY COLLEGE

Department of Engineering Technology

Mechanical Engineering Technology

Criterion 3 - Student Outcomes (1-5)

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 Mechanical 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 Mechanical 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 (1) - an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;

- **Performance Indicator MT1-1** Analyze mechanical systems in a mathematical environment at or above the level of algebra and trigonometry.
- **Performance Indicator MT1-2** Produce and interpret engineering drawings using technical graphics.
- **Performance Indicator MT1-3** Select material and design dimensions for safe operation of mechanical components.
- **Performance Indicator MT1-4** Apply technical knowledge of manufacturing and programming to the machine shop tools fabrication of mechanical parts.
- **Performance Indicator MT1-5** Interpret relevant technical standards.

Student Outcome (2) - an ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;

- **Performance Indicator MT2-1** Apply the basic laws of mechanics to components and structures.
- **Performance Indicator MT2-2** Evaluate mechanical structures for stress/strain response to applied loading.
- **Performance Indicator MT2-3** Analyze mechanical and thermodynamic systems.
- **Performance Indicator MT2-4** Utilize appropriate software tools to produce engineering drawings.

QUEENSBOROUGH COMMUNITY COLLEGE

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Student Outcome (3) -an ability to apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;

- **Performance Indicator MT3-1** Produce effective written documents including lab reports, term papers.
- **Performance Indicator MT3-2** Deliver effective oral presentations.
- **Performance Indicator MT3-3** Interpret visual and graphical information and data.
- **Performance Indicator MT3-4** Identify and use appropriate technical resources.

Student Outcome (4) - an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results;

- **Performance Indicator MT4-1** Identify material properties by applying standard experimental tests and interpreting the results.
- **Performance Indicator MT4-2** Analyze material response to applied loading by applying standard experimental tests and interpreting the results.
- **Performance Indicator MT4-3** Utilize industry standards in the analysis of mechanical systems comprised of structural or thermodynamic elements.
- **Performance Indicator MT4-4** Select appropriate manufacturing processes and apply technical knowledge using appropriate tools for the fabrication of mechanical components and systems.

Student Outcome (5) - an ability to function effectively as a member of a technical team;

- **Performance Indicator MT5-1** Assign and perform shared duties to accomplish a common task.
- **Performance Indicator MT5-2** Demonstrate an ability to communicate effectively with team members.

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Mechanical Engineering Technology Course Assignments for Student Outcomes “1-5” and supporting Performance Indicators “1-x to 5-x”

Courses	Title					
		1	2	3	4	5
	Major Requirements (32 cr.)					
Tech-100 or MT-100	Introduction to Engineering and Technology			3-2 3-3 3-4		
MT-111	Technical Graphics	1-2				
MT-122	Manufacturing Processes	1-3 1-4			4-2 4-3	
MT-124	Metallurgy & Materials			3-1 3-4	4-1 4-4	
MT-140	Engineering Analysis	1-1 1-5		3-1	4-1 4-2	
MT-161	Fundamentals of Computer Numerical Control	1-3 1-4 1-5				5-1 5-2
MT-293	Parametric Computer Aided Design Drafting	1-2	2-4			
MT-341	Applied Mechanics	1-1	2-1			
MT-345	Strength of Materials		2-1 2-2	3-3		
MT-369	Computer Apps in ET	1-3 1-4	2-2 2-4			
MT-491	Computer Controlled Manufacturing	1-3 1-4			4-4	
MT-492	Introduction to Virtual Automation		2-3	3-2		5-1 5-2
MT-523	Thermodynamics		2-3		4-3	
	MT-Electives (4 cr.)					
MT-125	Metallurgy & Materials Lab	1-5			4-1	5-1 5-2
MT-164	Computer-Integrated Manufacturing (CIM)					
MT-346	Strength of Materials Laboratory	1-5			4-2	5-1 5-2
MT-488	Computer Aided Design Drafting	1-2	2-4			
MT-525	Measurement Techniques in the Thermal Sciences	1-5			4-3	5-1 5-2

QUEENSBOROUGH COMMUNITY COLLEGE

Department of Engineering Technology

Mechanical Engineering Technology

MT-900	Cooperative Education & Design Projects			3-4		
	General Education Requirements					
MA-114	College Algebra & Trig for Technical Students	1-1				
MA-128	Calculus for Technical & Business Students	1-1				
PH-201	General Physics I	1-1				
PH-202	General Physics II	1-1				
EN-101	English Composition I			3-1		
EN-102	English Composition II			3-1		
SS or HI	Social Science/History Elec.			3-1		

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

- (1) An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve well-defined engineering problems appropriate to the discipline;
- (2) An ability to design solutions for well-defined technical problems and assist with engineering design of systems, components, or processes appropriate to the discipline;
- (3) An ability to apply written, oral, and graphical communication in well-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature;
- (4) An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results;
- (5) An ability to function effectively as a member of a technical team;