Mechanical Engineering Technology

67-credit Associate of Applied Science Degree

About the Program

Through WCTC's calculus-based Mechanical Engineering Technology program, learn the fundamentals behind 2- and 3-dimension drafting and computer modeling which will assist engineers by producing technical drawings that depict product details and dimensions. Gain the ability to analyze forces and determine how they influence motion and combined stresses in 3 dimensions and become skilled at designing parts and selecting materials for specific applications.

Upon graduation from WCTC, the student may transfer credits with junior standing to UW-Milwaukee's College of Engineering and Applied Science and be guaranteed admission into their CEAS Mechanical Engineering major. Many credits will also transfer into Marquette University's Mechanical Engineering program. Along the way, the student will save time and money and potentially benefit from employer tuition reimbursement while studying for a bachelor's degree.

Potential Job Titles

- Mechanical Designer
- Mold Designer
- Design Technician
- Senior Designer
- CAD Drafter
- Engineering Technician

Credit Transfer

Students must receive a grade of C or higher in a class to qualify for credit transfer. Records must be reviewed, and additional credit transfer specifics obtained, from the four-year college/university to which the student wants to attend. In addition to UWM and Marquette University, credits from the Mechanical Engineering Technology program may also transfer to other colleges/universities. Visit **www.wctc.edu/transfer** for additional information. Since details of credit transfers change periodically, be sure to contact the intended college/university to verify credit transferability.

Required Courses		Credits
First Semester		
420-160	Manufacturing Processes - Cold	2
606-115	Technical Drafting/CAD	4
606-117	Computer Programming Engineers	3
804-198	Calculus I	4
809-166	Intro to Ethics: Theory & App	3
Total semester credits		**16**
Second Semester		
606-114	GD/T-Drafters	3
606-121	Technical Statics	4
606-186	Pro E/Mechanical Design	3
804-156	Technical Calculus II	4
806-187	Calculus Based Physics I	3
Total semester credits		**17**
Third Semester		
606-104	CAD Drafting & Design	4+
606-123	Solid Mechanics	3
606-170	Kinematics	3
801-195	Written Communication	3+
809-199	Psychology of Human Relations	3
Total semester credits		**16**
Fourth Semester		
606-116	Machine Design Elements	3
606-125	Machine Design Problems	3
606-169	Dynamics	3
606-189	Finite Elem Analysis/Engineers	3
801-196	Oral/Interpersonal Communication	3+
809-195	Economics	3+
Total semester credits		**18**

+ Proficiency exam available

Curriculum is current as of catalog printing. The most current curriculum requirements for graduation will be provided upon admission to program, or review at www.wctc.edu.

Admission Process

- Fill out a WCTC application
- Send $30 non-refundable application fee
- Send high school transcript or GED/HSED
- Send any previous college transcripts
- Complete Skills Assessment test (COMPASS)
- Begin pursuing Financial Aid options

For more information, call 262.691.5200.

Mechanical Engineering Technology Required Courses

420-160 Manufacturing Processes – Cold **2**
Gain an introduction to manufacturing methods and the progression a part follows from a piece of raw stock to its finish.

606-104 CAD Drafting & Design **4**
Study advanced concepts of computer-aided drafting, including threaded and non-threaded fasteners, piping drawings, welding symbols and drawings, and CNC drawings. Examine the design process with a layout and assembly drawings unit.
Prerequisites: 606-115A Tech Drafting & CAD Intro and 606-115B Tech Drafting & CAD Adv; or 606-115 Technical Drafting/CAD and 606-186 PRO E/Mech Design; or 606-102A INTRO/TECH DFTG and 606-166B AutoCAD Drafting

606-114 GD/T-Drafters **3**
Learn the theoretical concepts of geometric dimensioning and tolerancing, and apply these concepts to actual parts that are required to draw. All studies are based on ASME & Y14.5M 1994 standard.
Prerequisites: 606-115 Technical Drafting/CAD (or concurrent); or Equivalent; or 606-102A INTRO/TECH DFTG and 606-166B AutoCAD Drafting

606-115 Technical Drafting/CAD **4**
Develop the necessary skills to sketch detail drawings within a context of current drafting and design standards. Use drafting boards and computer-aided drafting methods to complete assignments. Discuss geometric construction, orthographic projection, auxiliary and section views, functional dimensioning, tolerancing, and isometric drawing.

606-116 Machine Design Elements **3**
Learn the methods of selecting machine elements, such as shafts, bearings, clutches, and brakes, by type and size. Methods of selection are based on the typical problems encountered with each element, as well as the characteristics of function, stress analysis, and economics.
Prerequisites: 606-118 Basic Mechanisms and 606-122 Strength of Materials; or 606-123 Solid Mechanics and 606-170 Kinematics

606-117 Computer Programming Engineers **3**
Gain exposure to programming Visual Basic as employed to model a host of engineering systems providing insight into forces, stresses, motion and the energy of rigid bodies. The generation of equations and graphical solutions is also covered. Using consistent user-friendly and protection techniques which allow the reliable use of the developed program by others is emphasized. This course is geared for the mechanical design student.

606-121 Technical Statics **4**
Study the principles of force and force systems in equilibrium. Discuss various related topics, including statics of particles and rigid bodies in two- and three-dimensions; analysis for forces in trusses, frames, and machines; distributed forces; centroids; moment of inertia; and friction.
Prerequisites: 804-154 Technical Calculus I or 804-198 Calculus 1

606-123 Solid Mechanics **3**
Discuss the fundamentals of stress, strain, axial loading, torsion, bending, and shearing stresses in beam, deflection, combined stresses, Mohr's circle, and columns.
Prerequisites: 606-121 Technical Statics and 804-156 Technical Calculus II

606-125 Machine Design Problems **3**
Study layouts to extract information from them, write a research paper on a design proposal, and create a complete design project. Experience the team concept while completing these projects. Discuss the structure and function of the engineering department, ethics as they apply to the mechanical designer, and job opportunities in the mechanical design field.
Prerequisites: 606-116 Machine Design Elements (or concurrent) and 606-118 Basic Mechanisms and 606-122 Strength of Materials; or 606-116 Machine Design Elements (or concurrent) and 606-123 Solid Mechanics and 606-170 Kinematics

606-169 Dynamics **3**
Dynamics presents the motion and force systems on particles and rigid bodies, application of Newton's laws, rectilinear and curvilinear motion, plane motion, dynamic force analysis, work and energy, impulse and momentum, and mechanical vibration.
Prerequisites: 606-121 Technical Statics and 804-156 Technical Calculus II

606-170 Kinematics **3**
As a transfer student, explore the basic application of kinematic principles in the analysis and design of machine members such as linkages, cams, and gears. Use a mathematical approach for problem solving.
Prerequisites: 606-121 Technical Statics and 804-156 Technical Calculus II

606-186 PRO E/Mech Design **3**
Learn the basic concepts of 3-D modeling, and use software to create models, assemblies, and drawings typical of what industry uses. Study the concepts of parametric modeling and Parent/Child relations.
Prerequisites: 606-115 Technical Drafting/CAD; or 606-102A INTRO/TECH DFTG and 606-166B AutoCAD Drafting

606-189 Finite Elem Analysis/Engineers **3**
Application of Finite Elements Analysis (FEA) toward modeling static stress and basic thermal engineering systems. This course utilizes Pro-E Mechanica for the analysis. Topics include; Developing the FEA model, convergence, sensitivity, optimization, symmetry models, shells, beams and frames elements. Must apply lessons from previous courses to mathematically justify and/or predict FEA results.
Prerequisites: 606-123 Solid Mechanics or 606-122 Strength of Materials and 606-186 PRO E/Mech Design

801-195 Written Communication **3**
Study and practice the transfer of information, ideas, and experiences in written form through reports, letters, memoranda, and other documents. Gain proficiency in the areas of organization, clarity, accuracy, and directness.
Prerequisites: COMPASS-Writing Skills or ACT-English or ASSET-Writing Skills or Accuplacer Sentence Skills or TABE Advanced Language or 831-103 Intro to College Writing or 851-771 Writing-Program Readiness

801-196 Oral/Interpersonal Comm **3**
Practice the necessary skills for effective speech delivery, listening, assertiveness, conflict resolution, teamwork, and general interpersonal communication.

804-156 Technical Calculus II **4**
Apply integration techniques, partial derivatives, graphing conics, double integrals, polar coordinates, and first- and second-order differential equations to problems in science and engineering.
Prerequisites: 804-154 Technical Calculus I or 804-198 Calculus 1

804-198 Calculus 1 **4**
Analyze and graph algebraic expressions, especially conic sections. Develop an intuitive understanding of limits, derivatives and integrals. Apply the derivative and the integral to certain physical problems.
Prerequisites: 804-115 College Technical Math 1 and 804-116 College Technical Math 2 or 804-151 Technical Math I and 804-152 Technical Math II

806-187 Calculus Based Physics 1 **3**
Use a calculus-based approach to the study of physics. Topics include: units and unit conversions, mechanics, rotational mechanics, work and energy, oscillations and waves.
Prerequisites: 804-154 Technical Calculus I or 804-198 Calculus 1

809-166 Intro to Ethics: Theory & App **3**
Gain a basic understanding of the theoretical foundations of ethical thought. Diverse ethical perspectives will be used to analyze and compare relevant issues. Critically evaluate individual, social and/or professional standards of behavior, and apply a systematic decision-making process to these situations.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading

809-195 Economics **3**
Discuss the major institutions and principles that underlie the contemporary American economic system, and consider topics such as the free enterprise system, supply and demand, circular flow, government involvement, the Federal Reserve System, economic growth and development, the effects of international trade, comparative economic systems, and global economics.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading

809-199 Psychology of Human Relations **3**
Examine the principles of interaction as applied to human relations at home and on the job. Explore topics such, as self concept personality development, learning, motivation, emotions, stress, human relations processes, and special relationships.
Prerequisites: COMPASS-Reading Skills or 858-775 Reading - Program Readiness or 838-105 Intro Reading & Study Skills or TABE Advanced Reading or Accuplacer Reading Comprehensi or College Proficiency - Reading or Grandfathered Rdg Requirement or ACT-Reading