Mechanical Design Technology

66-credit Associate of Applied Science Degree

About the Program

Mechanical designers assist engineer by preparing technical drawings that provide visual guidelines for production workers to build things. Their drawings show technical product details, specify dimensions and structure and indicate materials and procedures. To prepare for this career, students will study manual as well as computer-aided drafting using the latest computer-aided design (CAD) applications. In addition, learn about manufacturing processes, strength of materials, basic mechanisms and 3-D modeling.

If drafting courses were taken in high school, the student may be eligible to transfer those credits into the Mechanical Design Technology program. Graduates of the Mechanical Design program may find positions such as mechanical designer, mold designer, CAD drafter, detailer or design technician. In addition, they may transfer their credits with junior-standing into Milwaukee School of Engineering's Mechanical Engineering Technology bachelor's degree program.

Potential Job Titles

- Mechanical Designer
- Mold Designer
- CAD Drafter
- Design Technician
- Detailer

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 MSOE, credits from the Mechanical Design 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		
606-110	Descriptive Geometry	2
606-115	Technical Drafting/CAD	4
606-162	Manufacturing Processes - Hot	2
804-115	College Technical Math 1	5+
809-166	Intro to Ethics: Theory & App	3
Total semester credits		**16**
Second Semester		
606-114	GD/T-Drafters	3
606-120	Statics	4
606-186	Pro E/Mechanical Design	3
804-116	College Technical Math 2	4
806-143	College Physics I	3+
Total semester credits		**17**
Third Semester		
420-160	Manufacturing Processes - Cold	2
606-104	CAD Drafting & Design	4+
606-117	Computer Programming Engineers	3
606-118	Basic Mechanisms	3
606-122	Strength of Materials	3
606-153	Co-op Education I-Industrial	1
Total semester credits		**16**
Fourth Semester		
606-116	Machine Design Elements	3
606-125	Machine Design Problems	3
801-195	Written Communication	3+
801-196	Oral/Interpersonal Communication	3+
809-199	Psychology of Human Relations	3
	Elective	2
Total semester credits		**17**

+ 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 Design 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

606-110 Descriptive Geometry **2**
Study orthographic theory as applied to graphic problem solving, and use principal and auxiliary projections to determine the relative positions of points, lines, and planes in space. Apply logic in planning procedural approaches to problem solutions.
Prerequisites: 606-115 Technical Drafting/CAD (or concurrent); or Equivalent

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.

606-118 Basic Mechanisms **3**
Examine the motion of machine components – including 4-bar linkages, cams, gears, v-belt drives and other power transmission units – in respect to displacement, velocity, and acceleration. Use graphical and mathematical analysis.
Prerequisites: 806-151 TECH PHYSICS I (or concurrent) or 806-180 Technical Physics I (or concurrent) or 806-143 College Physics 1 (or concurrent)

606-120 Statics **4**
Study force and moment diagrams with respect to their actions and reactions on machine components and structures.
Prerequisites: 804-151 Technical Math I or 804-115 College Technical Math 1

606-122 Strength of Materials **3**
Explore the principles of tension, compression, and shear stress to determine the correct size for structural beams and shafts. Become familiar with the design characteristics of materials and how heat treating affects their strength.
Prerequisites: 606-120 Statics

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

606-153 Co-op Educ I-Ind **1**
Gain a meaningful occupational experience. Hone technical competencies and interpersonal relationships that are stressed in seminars.
Prerequisites: Approval of Co-op Ed Office

606-162 Manufacturing Process - Hot **2**
Develop a background in processes and materials used in the foundry, forging, welding, and plastics industries. Selection of materials and material applications will also be studied.

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

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.

804-115 College Technical Math 1 **5**
Topics include: solving linear, quadratic, and rational equations; graphing; formula rearrangement; solving systems of equations; percent; proportions; measurement systems; computational geometry; right and oblique triangle trigonometry; trigonometric functions on the unit circle; and operations on polynomials. Emphasis will be on the application of skills to technical problems. This course is the equivalent of successful completion of College Technical Mathematics 1A and College Technical Mathematics 1B.

804-116 College Technical Math 2 **4**
Topics include: vectors; trigonometric functions and their graphs; identities; exponential and logarithmic functions and equations; radical equations; equations with rational exponents; dimension of a circle; velocity; sine and cosine graphs; complex numbers in polar and rectangular form; trigonometric equations; conic sections; and analysis of statistical data. Emphasis will be on the application of skills to technical problems.
Prerequisites: 804-115 College Technical Math 1 or 804-151 Technical Math I or Associate Dean approval

806-143 College Physics 1 **3**
Learn the applications and theory of basic physics principles. Emphasis is on problem solving, laboratory investigation and applications. Topics include laboratory safety, unit conversions and analysis, kinematics, dynamics, work, energy, power, temperature and heat.
Prerequisites: 804-115 College Technical Math 1 (or concurrent) or 804-151 Technical Math I or 804-153 Unified Algebra & Trigonometry or 804-154 Technical Calculus I or 804-198 Calculus 1 (or concurrent)

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

809-199 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

Elective Options
606-117 Computer Programming Engineers
606-140 Solidworks/Mech Design
606-151 Co-op Education I - Ind Occ
606-152 Co-op Education II - Ind Occ

Any course at the associate degree level will meet the elective requirement.