MECHANICAL TECHNOLOGY (606)

Mechanical Technology (606)

606-104. CAD Drafting & Design. (4 Credits)
Study advanced concepts of 3D Modeling, 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: 606-115 with a minimum grade of C and 606-186 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=104)

606-110. Descriptive Geometry. (2 Credits)
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 (may be taken concurrently) with a minimum grade of C-) or (Equivalent)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=110)

606-114. GD&T. (3 Credits)
In this class the student will learn the symbols, modifiers, rules, and concepts of Geometric Dimensioning and Tolerancing. Based on material conditions the student determines feature tolerance zones for location, form, orientation, runout and profile tolerances as specified on drawings. The student utilizes part function in the development of datums and feature tolerances while creating dimension drawings per ASME Y14.5 – 2009. Inspection methods used to verify part compliance to specified tolerances are also covered as is functional gauge design.
Prerequisites: 606-186 with a minimum grade of C or 439-181 with a minimum grade of C or 457-150 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=114)

606-115. Technical Drafting/CAD. (4 Credits)
Develop working drawings per current drafting standards for the purpose of manufacturing mechanical components. Free-hand sketching and computer aided drafting are used to create detail and assembly drawings with an emphasis on multi-view projection, functional dimensioning, and tolerancing.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=115)

606-116. Machine Design Elements. (3 Credits)
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: (801-136 with a minimum grade of C- or 801-195 with a minimum grade of C- or 801-223 with a minimum grade of C-) and (801-196 with a minimum grade of C- or 801-198 with a minimum grade of C-) and (606-118 (may be taken concurrently) with a minimum grade of C or 606-123 with a minimum grade of C) and (606-170 with a minimum grade of C or 606-122 with a minimum grade of C) and 606-117 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=116)

606-117. Computer Programming Engineers. (3 Credits)
This course utilizes Excel and Visual Basic programming to model a host of engineering systems providing insight into forces, stresses, motion and the energy of rigid bodies. The generation of equations from data, technical graphing, solving engineering problems numerically and the concept of convergence through looping methods are also covered. The programming concepts presented in this course are exclusively applied to mechanical systems.
Prerequisites: (804-196 with a minimum grade of C or 804-197 with a minimum grade of C) or (804-116 with a minimum grade of C or ALEKS Math Placement with a score of 76 or 804-198 (may be taken concurrently) with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=117)

606-118. Basic Mechanisms. (3 Credits)
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: (806-143 with a minimum grade of C or 806-187 with a minimum grade of C) and 606-115 with a minimum grade of C and 606-117 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=118)

606-120. Statics. (4 Credits)
Study force and moment diagrams with respect to their actions and reactions on machine components and structures.
Prerequisites: (804-114 with a minimum grade of C- or 804-115 with a minimum grade of C-)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=120)

606-121. Technical Statics. (4 Credits)
Study the principles of force and force systems in equilibrium by developing a working knowledge of how to determine and manipulate them mathematically using 3-dimensional vectors. Applications include statics of particles and rigid bodies, analysis of forces in trusses, frames, and machines; distributed forces; centroids; moment of inertia; and friction. There is extensive application of computer programming to perform vector math in this course.
Prerequisites: 804-198 with a minimum grade of C-
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=121)

606-122. Strength of Materials. (3 Credits)
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 (may be taken concurrently) with a minimum grade of C or 606-121 with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=122)

606-123. Solid Mechanics. (3 Credits)
In this course, the student develops a working knowledge of how materials react under loads and the mathematics used to model such systems. Tension, compression, bending and shear stress are covered in a variety of applications. More specific engineering applications studied include bearings, beams, columns, shafts, and vessels. Mohr's circle principles are applied to model combined stresses.
Prerequisites: 606-121 (may be taken concurrently) with a minimum grade of C and 804-198 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=123)

606-124. Internship-Mechanical Design. (1 Credit)
Gain meaningful occupational experience in the field of mechanical design while building interpersonal relationships, improving technical competencies and completing the pre-developed goals. To complete an internship, WCTC must first verify that students have met the prerequisites. Please contact the Career Connections Department at 262.695.7848 or internshipdepartment@wctc.edu for assistance.
Prerequisites: Approval of Co-op Ed Office
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=124)

606-125. Machine Design Problems. (3 Credits)
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 (may be taken concurrently) with a minimum grade of C and 606-104 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=125)

606-135. Engineering Design Projects I. (2 Credits)
In this course, the student further develops 3D modeling skills such as complex sweeps, surfaces, patterns, family tables, ribs, drafts, and advanced assemblies. Parts and assemblies are significantly more complex than in the introductory course. Building on skills previously learned, students analyze and document designs. Programming to control model parameters and views is also employed. Following industry standards and good modeling practices are stressed.
Prerequisites: (606-186 with a minimum grade of C) and 606-114 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=135)

606-137. Measurement/Experimentation. (3 Credits)
Gain an introduction to the lab procedures, measurement tools, measurement instruments and lab reports used in the mechanical profession. Apply statistics and probability to data sampling and analysis.
Prerequisites: 606-117 with a minimum grade of C and (606-123 with a minimum grade of C or 606-122 with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=137)

606-145. Engineering Design Projects II. (2 Credits)
Design, document and prototype build a capstone project. Work in teams to select a project and define the scope and path to completion. Apply people and technical skills while performing necessary computations, completing product documentation and building a proof-of-concept prototype.
Prerequisites: 606-123 with a minimum grade of C and 606-170 with a minimum grade of C and 606-135 with a minimum grade of C and 606-162 (may be taken concurrently) with a minimum grade of C and 606-116 (may be taken concurrently) with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=145)

606-153. Internship - Applied Tech. (1 Credit)
Gain meaningful occupational experience in a specific field while building interpersonal relationships, improving technical competencies and completing the pre-developed goals. To complete an internship, WCTC must first verify that students have met the prerequisites. Please contact the Career Connections Department at 262.695.7848 or internshipdepartment@wctc.edu for assistance.
Prerequisites: Approval of Co-op Ed Office
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=153)

606-162. Manufacturing Process - Hot. (2 Credits)
This course provides the mechanical designer with 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.
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=162)

606-169. Dynamics. (3 Credits)
In this course, the student combines the equations of motion with forces and torques to examine the motion of rigid bodies using 3-dimensional vectors. Newton's laws are applied to perform dynamic force analysis. The principles of work, energy, impulse and momentum are also employed. Free, forced, and damped mechanical vibrations are also studied. There is extensive application of computer programming to model systems in this course.
Prerequisites: 606-121 with a minimum grade of C and 804-198 with a minimum grade of C and 606-170 with a minimum grade of C and 606-117 with a minimum grade of C and 806-187 with a minimum grade of C
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=169)

606-170. Kinematics. (3 Credits)
In this course, the student applies the equations of motion to design and analyze mechanical systems such as linkages, cams, gears, belts, and chains. AutoCad is employed to layout designs and graphically solve for variables. The student performs displacement, velocity, and acceleration calculations in a vector format. There is extensive application of computer programming to model systems in this course.
Prerequisites: (606-121 with a minimum grade of C and 606-115 with a minimum grade of C and 804-198 with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=170)

606-186. 3D/Parametric Design. (3 Credits)
Learn the basic concepts of 3-D modeling, and use software to create models, assemblies and drawings typical of what industry uses.
Prerequisites: (606-115 (may be taken concurrently) with a minimum grade of C) or (606-102A with a minimum grade of C and 606-166B with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=186)

606-189. Finite Elem Analysis/Engineers. (3 Credits)
Students apply Finite Elements Analysis (FEA) toward modeling objects under loads. This course utilizes Creo Simulate software for the analysis. Topics include: Developing the FEA model, convergence, sensitivity, optimization, symmetry models, shells, beams and frames. In this course, the student must apply lessons from previous courses to mathematically justify and/or predict FEA results.
Prerequisites: (606-123 with a minimum grade of C and 606-186 with a minimum grade of C)
See sections of this course (http://www.wctc.edu/academics/programs-courses/course-search/course-search-listing.php?code=606&num=189)