



Undergraduate Course Descriptions Effective Fall 2007

https://www.banweb.mtu.edu/pls/owa/stu_ctg_utils.p_online_all_courses_ug

Engineering Fundamentals

ENG 1001 - Engineering Problem Solving

Introduction to the engineering problem solving method and to modern tools used to solve problems.

Credits: 2.0

Lec-Rec-Lab: (0-0-3)

Semesters Offered: Fall

Pre-Requisite(s): MA 1031(C) or MA 1032(C)

ENG 1002 - Introduction to 3-D Spatial Visualization

Intended for first-year engineering students with a demonstrated need for the development of 3-D spatial visualization skills. Topics include isometric sketching, orthographic projection, object transformations, 3-D coordinate systems, patterns folding to 3-D objects, and cross sections of solids.

Credits: 1.0

Lec-Rec-Lab: (0-0-2)

Semesters Offered: Fall

ENG 1003 - Introduction to Computer Aided Drafting

Fundamentals of creating engineering drawings with modern CAD software. Topics include basic geometric construction, drawing modification, dimensioning, and working with layers.

Credits: 1.0

Lec-Rec-Lab: (0-0-2)

Semesters Offered: Spring

Pre-Requisite(s): ENG 1101 or ENG 1002 or ENG 1100

ENG 1100 - Engineering Analysis

An introduction to the engineering profession. Focuses on engineering analysis, computational skills, and communication skills.

Credits: 2.0

Lec-Rec-Lab: (0-0-3)

Semesters Offered: Spring

Pre-Requisite(s): ENG 1001 and (MA 1160(C) or MA 1161(C) or MA 1140(C))

ENG 1101 - Engineering Analysis and Problem Solving

An introduction to the engineering profession and to its various disciplines. Focuses on developing problem-solving skills, computational skills, and communication skills. Through active, collaborative work, students work on teams to apply the engineering problem-solving method to "real-world" problems.

Credits: 3.0

Lec-Rec-Lab: (0-0-5)

Semesters Offered: Fall, Spring, Summer

Pre-Requisite(s): MA 1160(C) or MA 1161(C) or MA 1140(C)

ENG 1102 - Engineering Modeling and Design

Continuation of ENG1101. Introduction to the engineering design process with an emphasis on graphics and documentation. Focuses on engineering problem solving in the context of the design process.

Credits: 3.0

Lec-Rec-Lab: (0-0-5)

Semesters Offered: Fall, Spring, Summer

Pre-Requisite(s): ENG 1101 or (ENG 1001 and ENG 1100) and (MA 2160(C) or MA 2140(C))

ENG 1990 - Special Topics in Engineering

Engineering topics of interest to students and faculty that are not normally covered in the existing courses.

Credits: variable to 5.0; Repeatable to a Max of 6

Semesters Offered: On Demand

ENG 2110 - Statics

Force systems in two or three dimensions. Includes composition and resolution of forces and force systems, principles of equilibrium applied to various bodies, simple structures, friction, centroids, and moments of inertia. Vector algebra used where appropriate.

Credits: 3.0

Lec-Rec-Lab: (0-3-0)

Semesters Offered: Fall, Spring

Pre-Requisite(s): MA 2160

ENG 2120 - Statics-Strength of Materials

The composition and resolution of forces and force systems, principles of equilibrium applied to various bodies, simple structures, friction, and 2nd moments of area. Intro to the mechanical behavior of materials, including calculation of stresses, strains, and deformations due to axial, torsional, and flexural loading.

Credits: 4.0

Lec-Rec-Lab: (0-4-0)

Semesters Offered: Fall, Spring

Restrictions: May not be enrolled in one of the following Major(s): Civil Engineering, Mechanical Engineering

Pre-Requisite(s): MA 2160 and PH 2100

ENG 2150 - Mechanics of Materials

Introduction to mechanical behavior of materials, including stress/strain at a point, principle stresses and strains, stress-strain relationships, determination of stresses and deformations in situations involving axial loading, torsional loading of circular cross sections, and flexural loading of straight members. Also covers stresses due to combined loading and buckling of columns.

Credits: 3.0

Lec-Rec-Lab: (0-3-0)

Semesters Offered: Fall, Spring

Pre-Requisite(s): ENG 2110 or MEEM 2110

ENG 2990 - Special Topics in Engineering

Engineering topics of interest to students and faculty that are not normally covered in the existing courses.

Credits: variable to 5.0; Repeatable to a Max of 6

Semesters Offered: On Demand

ENG 3000 - Engineering for Non-Believers

Everything you wanted to know about engineering but were afraid to ask. This course will take students on a journey through time investigating engineering's greatest feats and greatest lies. Students will work in teams to uncover basic engineering principles and how basic math skills help engineers do the things they do.

Credits: 3.0

Lec-Rec-Lab: (0-2-2)

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following College(s): College of Engineering

Pre-Requisite(s): UN 2002(C)

ENG 3200 - Thermodynamics/Fluid Mechanics

Provides engineering students with a unified understanding of the fundamental conservation laws and property accounting applied to thermodynamic and fluid dynamic systems. Topics will include but are not limited to: ideal gas behavior; heat, work, and energy; 1st and 2nd laws of thermodynamics; heat pumps; cycles; hydrostatics; Bernoulli; pipe flow and loss; and lift and drag.

Credits: 4.0

Lec-Rec-Lab: (0-4-0)

Semesters Offered: Fall, Spring

Pre-Requisite(s): MA 2160 and (CH 1100 or CH 1110) and PH 2100

ENG 3507 - Introduction to Fluid Mechanics

Provides engineering students with a unified understanding of fluid dynamic systems. Topics will include but are not limited to hydrostatics, Bernoulli, pipe flow and loss, and lift and drag. Course offered second half of spring semester.

Credits: 2.0

Lec-Rec-Lab: (0-2-0)

Semesters Offered: Spring

Pre-Requisite(s): PH 2100 and (CH 1100 or CH 1110) and MA 2160

ENG 3530 - Undergraduate Colloquium in Sustainability

Readings and speakers are used to teach concepts of sustainable development and global sustainability. Specific topics are derived from the industrialized and developing world.

Credits: 1.0

Lec-Rec-Lab: (0-1-0)

Semesters Offered: Fall

Restrictions: May not be enrolled in one of the following Class(es): Graduate

ENG 3990 - Special Topics in Engineering

Engineering topics of interest to students and faculty that are not normally covered in the existing courses.

Credits: variable to 5.0; Repeatable to a Max of 6

Semesters Offered: On Demand

ENG 4160 - Teaching Methods in Technology and Design

Course intended for students pursuing technology and design secondary teacher certification. Students enroll in this course during the semester of their directed teaching.

Credits: 1.0

Lec-Rec-Lab: (0-0-3)

Semesters Offered: On Demand

Co-Requisite(s): ED 4710

ENG 4510 - Sustainable Futures I

Covers introductory and intermediate concepts of Sustainable Development. Explores methods/tools for assessing sustainability (economic, environmental, societal impacts) of current and emerging industrial technologies. Explores relationships between government policies and markets for introducing sustainable technologies into national economies and corporations.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Fall

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

Pre-Requisite(s): UN 2002

ENG 4900 - Multidisciplinary Senior Design Project I

Introduction to engineering design, including modeling, simulation, economic decision making, and reliability. Integration of design principles in the solution of open-ended engineering problems. Projects are defined and planned with faculty and industrial guidance. Emphasizes economics and environmental constraints. Students must be Senior Project ready as defined by major.

Credits: 3.0

Lec-Rec-Lab: (0-1-6)

Semesters Offered: Fall, Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

ENG 4905 - Engineering Design Project

Students complete a multidisciplinary engineering design project. Students must be Senior Project ready as defined by major. Not open to students who have taken ENG4900 or ENG4910.

Credits: 3.0

Lec-Rec-Lab: (0-2-3)

Semesters Offered: On Demand

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

ENG 4910 - Multidisciplinary Senior Design Project II

Continuation of ENG4900. Introduction to engineering design including modeling, simulation, economic decision making and reliability. Integration of design principles in the solution of open-ended engineering problems. Projects are defined and planned with faculty and industrial guidance. Emphasizes economics and environmental constraints. (Senior project ready as defined by major substitutes for prerequisites)

Credits: 3.0

Lec-Rec-Lab: (0-1-6)

Semesters Offered: Fall, Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore, Junior

Pre-Requisite(s): ENG 4900

ENG 4990 - Special Topics in Engineering

Engineering topics of interest to students and faculty that are not normally covered in the existing courses.

Credits: variable to 3.0; Repeatable to a Max of 6

Semesters Offered: On Demand

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For more information, contact

Office of Student Records and Registration

Michigan Technological University

1400 Townsend Drive

Houghton, Michigan 49931-1295

906/487-2319

Fax: 906/487-3343

Email: stuosrr@mtu.edu