

# MET-1100: TECHNOLOGY ORIENTATION

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## Cuyahoga Community College

**Viewing: MET-1100 : Technology Orientation**

**Board of Trustees:**

December 2023

**Academic Term:**

Fall 2024

**Subject Code**

MET - Mech Eng/Manuf Ind Eng Tech

**Course Number:**

1100

**Title:**

Technology Orientation

**Catalog Description:**

Orientation and exploration of Engineer's/technician's role as part of industrial team including careers, opportunities and job-hunting skills. Topics include Engineering ethics, use of the computer, basic measurement and calculation skills and engineering drawing concepts. Introduction to oral, technical writing and graphic methods of communication. Introduction to professional organizations, journals and tools for professional enhancement to provide a path for lifelong learning.

**Credit Hour(s):**

2

**Lecture Hour(s):**

1

**Lab Hour(s):**

2

**Other Hour(s):**

0

## Requisites

**Prerequisite and Corequisite**

MATH-0965 Intermediate Algebra or qualified Math placement to place into MATH-1530 College Algebra.

## Outcomes

**Course Outcome(s):**

Determine his/her interest and aptitudes for Engineering/ technical education and employment.

**Objective(s):**

1. Describe the different areas of study in the Engineering Technology field.
2. Determine his/her interests and aptitudes for engineering/ technical education and employment.
3. Use the Internet to access, communicate, and retrieve information.
4. Assess the basic skills needed for successful completion of Engineering/ technical degree.
5. Define engineering and technical terminology.
6. Define the members of the industrial team.
7. Describe the design process.

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**Course Outcome(s):**

Describe the engineering profession and engineering ethics, including professional practice and licensure.

**Objective(s):**

1. Describe the code of ethics of the National Society of Professional Engineers.

2. Explain the Academic Dishonesty, conflict of interest and professional responsibility.

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**Course Outcome(s):**

Draw and interpret orthographic and pictorial sketches.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Develop visualization skills.
2. Identify orthographic and pictorial drawings.
3. Use the Internet to access, communicate, and retrieve information.

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**Course Outcome(s):**

Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering .

**Objective(s):**

1. Define audience and purpose in both oral and written technical reports.
2. Explain oral and written communication procedures used in engineering and technology and use of computer tools such as Microsoft Word.
3. Graph or chart lab/test results clearly for a technical audience by using computational tools (e.g., Microsoft Excel etc...).
4. Use the proper communication skills with the right audience.
5. Discuss communication issues that arise in a technical community.
6. Use the Internet to access, communicate, and retrieve information.

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**Course Outcome(s):**

Apply knowledge of computer hardware/software relationships, peripherals, terminology, procedures and processes.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Discuss the impact of computers on society, now and in the future.
2. Make the computer work through judicious development or use of software.
3. Interact with the computer, generate input to the computer, and interpret output from the computer.
4. Explain common system software concepts.
5. Demonstrate an understanding of the basic terminology and concepts associated with programming languages and software.
6. Discuss the function, applications, and concepts of word processing software.
7. Use the Internet to access, communicate, and retrieve information.

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**Course Outcome(s):**

Explore the impact engineering has had on the modern world.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Describe developing technological systems.
2. Use the internet access to evaluate carbon footprint.
3. Identify industry's responsibility to the environment.

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**Course Outcome(s):**

Understand fundamental dimensions, units, length-/time-/mass-/force-/temperature-related variables .

**Objective(s):**

1. Describe the two major dimensional units and conversion.
2. Derive dimensions of physical quantities/variables by using fundamental dimensions applied to different engineering disciplines (e.g. Mechanical, Electrical etc....).

**Course Outcome(s):**

Perform technical measurements and calculations.

**Essential Learning Outcome Mapping:**

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

**Objective(s):**

1. Relate basic mathematics and statistics used in engineering to real-life problems.
2. Use the Internet to access, communicate, and retrieve information.
3. Use common and precise measuring tools.
4. Use basic geometry and trigonometry concepts.
5. Apply scientific and engineering notation.

**Methods of Evaluation:**

1. Assignments and projects
2. Lab Assignments (i.e. Fuel Cell experiments, AutoCAD Assignments)
3. Quizzes and/or midterm examination
4. Final examination

**Course Content Outline:**

1. Career Exploration
  - a. Introduction to Cuyahoga Community College's Programs, Degrees & Transfer
  - b. History of engineering and technology
    - i. Man's relation
    - ii. Ancient
    - iii. Middle ages
    - iv. Modern times
  - c. Industrial team & The Design Process
    - i. Scientist
    - ii. Engineer
    - iii. Technologist
    - iv. Technician
    - v. Craftsperson
  - d. Engineering and technical fields
    - i. Opportunities
    - ii. Wages
    - iii. Job hunting skills
      1. Resume
      2. Cover letter
      3. Thank you letter
  - e. Professional Lifelong learning
    - i. Research organizations in various engineering fields.
      1. History & Roles of individuals who practice the field.
      2. Membership requirements
    - ii. Journals in engineering
      1. Apply them in interpreting Lab Reports
      2. Apply them as sources for the technical report
  - f. Engineering Ethics

- i. The code of ethics of the National Society of Professional Engineers
  - ii. Engineers creed
  - iii. Academic Dishonesty, conflict of interest, and professional Responsibility
2. Measurement and Calculation
  - a. Fundamental units
  - b. Measuring tools
  - c. Different unit systems and Conversion of units
  - d. Basic geometry concepts
  - e. Basic trigonometry concepts
  - f. Scientific and engineering notation
  - g. Basic Statistics
3. Technical drawing and visualization
  - a. Catalogs, literature, and other resources
  - b. Orthographic
  - c. Isometric
  - d. Oblique
  - e. Perspective
4. Special techniques of technical writing and communication
  - a. Organization
  - b. Audience
  - c. Summaries
  - d. Page design
  - e. Word processing
  - f. Graphical representation
  - g. Formats
  - h. Lab reports
  - i. Technical reports
  - j. Presentations
  - k. Oral Reports
  - l. Critiques
5. Computer Literacy
  - a. Introduction to the computer
    - i. Uses as a creative tool
    - ii. Uses as a technical tool
  - b. Operational systems
    - i. Software
    - ii. Hardware
  - c. Information processing
    - i. History
    - ii. Development
    - iii. Need
    - iv. Components
    - v. Processing cycle
6. Problem Solving, creative thinking, and presentation of data as used in technical work
  - a. Use if computational tools to analyze and present data
    - i. Microsoft Excel
    - ii. Microsoft Word
7. Future of technology and its ethical implications with regards to the global community
  - a. Introduction of various areas in technology with future applications
  - b. Robotics
  - c. Optical systems
  - d. Materials
  - e. Photovoltaics
  - f. Wind Power
  - g. Fiber optics
8. Environmental concerns
  - a. Improving the environment through technology
  - b. Protecting the environment

## Resources

Oakes, Leone, Gunn. *Engineering Your Future: A Brief Introduction to Engineering*. 6th ed. Chesterfield, MO: Greate Lakes Press, 2016.

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Kalpakjian, Serope and Steven Schmid. *Manufacturing, Engineering & Technology*. 8th ed. Upper Saddle River, NJ: Prentice Hall, 2021.

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Wheeler, Anthony and Ahmad Ganji. *Introduction to Engineering Experimentation*. 3rd Ed. Upper Saddle River, NJ: Prentice Hall, 2010.

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Pond, Robert J. *Introduction to Engineering Technology*. 8th ed. Upper Saddle River, NJ: Prentice Hall, 2013.

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Hart, Hilary. *Introduction to Engineering Communication*. 2e. Upper Saddle River, NJ: Pearson-Prentice Hall, 2009.

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Saeed Moaveni. *Engineering Fundamentals - An Introduction to Engineering*. 6th Edition. Cengage Learning, 2020.

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