



# Course Outcome Summary

Required Program Core Course

## METC 160 Math Applications in Engineering Technology

### Course Information

Division	Applied Science and Engineering Technology
Contact Hours	3.0
Lab Hours	2.0
Total Credits	2.0

### Prerequisites

MATH 164 or MATH 157 and MATH 159

### Course Description

This course is an introduction to the concepts of statistics and calculus as they apply to engineering technology, focusing on the application of spreadsheet and math analysis software. Topics range from experimental data reduction to numerous examples from mechanical and electrical systems.

**This course is a required core course for students pursuing a(n)**

MECHANICAL ENGINEERING TECHNOLOGY  
NUCLEAR ENGINEERING TECHNOLOGY

### Program Outcomes Addressed by this Course:

Upon successful completion of this course, students should be able to meet the program outcomes listed below:

#### Mechanical Engineering Technology

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
  - I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.
- J. Communicate effectively, and work as part of a team.

#### Nuclear Engineering Technology

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills
- I. Communicate effectively, and work as part of a team



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**METC 160**  
**Math Applications in Engineering Technology**

## Course Outcomes

In order to evidence success in this course, the students will be able to:

1. Apply a spreadsheet program (example: Microsoft Excel) to an Engineering Technology problem

### Mechanical Engineering Technology

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- H. Select and apply power generation and power transmission components including mechanical, pneumatic, hydraulic, thermal, and electrical types.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.

### Nuclear Engineering Technology

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills



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**METC 160**  
**Math Applications in Engineering Technology**

2. Plot functions using spreadsheet software

## **Mechanical Engineering Technology**

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.

## **Nuclear Engineering Technology**

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills



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**METC 160**  
**Math Applications in Engineering Technology**

3. Perform a fundamental statistical analysis of data sets

## **Mechanical Engineering Technology**

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.
- J. Communicate effectively, and work as part of a team.

## **Nuclear Engineering Technology**

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills
- I. Communicate effectively, and work as part of a team



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# Course Outcome Summary

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**METC 160**  
**Math Applications in Engineering Technology**

## 4. Relate distribution of data to probability

### **Mechanical Engineering Technology**

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.
- J. Communicate effectively, and work as part of a team.

### **Nuclear Engineering Technology**

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills
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# Course Outcome Summary

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**METC 160**  
**Math Applications in Engineering Technology**

5. Solve systems of linear equations using matrix functions

## **Mechanical Engineering Technology**

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.

## **Nuclear Engineering Technology**

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills



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# Course Outcome Summary

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**METC 160**

**Math Applications in Engineering Technology**

6. Estimate derivatives and integrals of functions

## **Mechanical Engineering Technology**

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.

## **Nuclear Engineering Technology**

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills



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# Course Outcome Summary

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## METC 160 Math Applications in Engineering Technology

7. Estimate solutions of differential equations for problems involving electromechanical systems

### Mechanical Engineering Technology

- A. Identify and define problems in mathematic and scientific terms.
- B. Produce graphic representations of designs using CAD software, Solid Modeling software, and pencil and paper methods.
- C. Select materials and determine component sizes and shapes to meet design criteria.
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications.
- I. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills.

### Nuclear Engineering Technology

- B. Explain the requirement for documentation, formal procedures, and recordkeeping for nuclear related activities
- F. Identify and define problems in mathematics and scientific terms
- G. Recognize assumptions and limits of analysis to the application of technology, including social and ethical implications
- H. Recognize the need to engage in lifelong learning, and to perform research or conduct investigations to continuously upgrade knowledge and skills

Date Updated: 9/11/2019  
By: MJ Dubois