COURSE INFORMATION

COURSE TITLE
MAT108 Technical Mathematics

COURSE DESCRIPTION
Covers mathematical material designed for career and technical students. Topics include measurement, algebra, geometry, trigonometry, and vectors. These are presented at an introductory level and the emphasis is on applications.

CREDIT HOURS
4

CCCOnline Course Policies

The CCCOnline Course Policies page contains information about the student’s role in the classroom, grading policies, and rights and responsibilities.
**COURSE MATERIALS**

You can purchase all course materials (texts, calculators, software, etc), either with cash, a credit card or financial aid from your home college bookstore. Click on the “Ready to Order” option and select the bookstore from which you’d like to make your purchase.

Your textbook is available online as an eText. You do not need to purchase any additional materials. For specific information on refund policies and the optional black and white textbook available for purchase please contact the CCCOnline bookstore.

**MINIMUM COMPUTER REQUIREMENTS**

To complete this course, you will need regular access to a computer from which you can get to the internet and use email. In order to ensure that your course functions properly, you must run the System Check. This is a CRITICAL STEP, and taking the time to do it now will eliminate a tremendous amount of frustration for you later. To run the System Check, click Tools in the course NavBar and then click System Check.

**REQUIRED eTEXT**


**DIGITAL MATERIALS ACCESS AND SETUP**

This course integrates the digital content directly into the course site.

- Visit the Pearson Direct Integration Course Start page for details on first access to the materials.

To make sure your computer is set up correctly to access the e-Text and other digital content, review the Pearson Technical Support page, also linked in the Technical Support Module.
COURSE COMPETENCIES AND OUTCOMES

STUDENT COMPETENCIES

The competencies you will demonstrate in this course are as follows:

A. Solve applications of ratios and direct and inverse proportions.
B. Examine measurement with accuracy and precision.
C. Perform computations with signed numbers including scientific and engineering notation forms.
D. Solve algebraic equations and formulas with an emphasis on applications.
E. Analyze angle relationships.
F. Solve trigonometric problems with an emphasis on applications.
G. Analyze polygons and circles with an emphasis on applications.
H. Analyze basic geometric solids with an emphasis on applications.
I. Interpret the coordinate plane and vectors with an emphasis on applications.
J. Interpret data using introductory statistics.

The module outcomes that will permit you to demonstrate course competencies are:

MODULE 1

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Show how to navigate in D2L and Pearson MyLabs.</td>
<td>n/a</td>
</tr>
<tr>
<td>2  Convert among fractions, decimals and percents.</td>
<td>A</td>
</tr>
<tr>
<td>3  Solve percents.</td>
<td>A</td>
</tr>
<tr>
<td>4  Solve rate/base/percentage problems.</td>
<td>A</td>
</tr>
<tr>
<td>5  Convert within and between U.S. and Metric units.</td>
<td>B</td>
</tr>
<tr>
<td>6  Convert from one unit of time to another.</td>
<td>B</td>
</tr>
<tr>
<td>7  Convert between Fahrenheit and Celsius temperatures.</td>
<td>B</td>
</tr>
<tr>
<td>8  Round numbers off correctly depending on the accuracy or precision required.</td>
<td>B</td>
</tr>
<tr>
<td>9  Identify significant digits.</td>
<td>B</td>
</tr>
<tr>
<td>10 Demonstrate the rules for adding, subtracting, multiplying, dividing signed numbers with orders of operations.</td>
<td>C</td>
</tr>
<tr>
<td>11 Multiply and Divide by Powers of Ten.</td>
<td>C</td>
</tr>
<tr>
<td>12 Convert numbers from Scientific Notation to Ordinary Notation and vice versa.</td>
<td>C</td>
</tr>
</tbody>
</table>
MODULE 2

Outcomes
1. Determine data from circle, bar and line graphs.
2. Determine the probability of an event occurring.
3. Determine the odds of an event occurring.
4. Find measures of relative position.
5. Calculate mean, and mode for data sets.
6. Find the range, midrange, and standard deviation of data sets.
7. Identify terminology of equations.
8. Solve linear equations.
10. Solve algebraic equations and formulas.
11. Solve equations that are proportions.
12. Solve direct variation problems.
13. Solve inverse variation problems.

MODULE 3

Outcomes
1. Solve systems of linear equations by graphing.
2. Solve systems of linear inequalities by graphing.
3. Calculate the slope of a line given two points.
4. Find linear equations of lines.
5. Solve systems of linear equations using the addition method.
7. Multiply and divide powers with like bases.
8. Determine powers of powers.
9. Identify polynomials, monomials, binomials and trinomials.
10. Identify the degree of polynomials.
11. Add, subtract and multiply polynomials and monomials.
12. Multiply two binomials using the FOIL method.
13. Divide monomials by monomials.

MODULE 4

Outcomes
1. Calculate formulas with one exponential term.
2. Calculate formulas that contain a power of the natural exponential.
3. Write exponential equations as equivalent logarithmic equations.
4. Write logarithmic equations as equivalent exponential equations.
5. Calculate common and natural logarithmic expressions.
6. Calculate logarithms with a base other than 10 or e.
7. Calculate formulas containing at least one logarithmic term.
8. Simplify logarithmic expressions using the properties of logarithms.
9. Classify angles according to size.
10. Convert angle measures between decimal degrees and degrees, minutes, and seconds.
11. Calculate the perimeter and area of polygons using the appropriate formulas.
12. Calculate the circumference and area of circles.
13. Convert angle measures between degrees and radians.
14. Calculate the arc length of sectors.
15. Calculate the volume and surface area of three-dimensional objects.
## Module 5

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Classify triangles.</td>
<td>G</td>
</tr>
<tr>
<td>2 Solve problems involving similar triangles.</td>
<td>G</td>
</tr>
<tr>
<td>3 Solve problems using the Pythagorean Theorem.</td>
<td>G</td>
</tr>
<tr>
<td>4 Find unknown parts of triangles.</td>
<td>G</td>
</tr>
<tr>
<td>5 Find unknown parts of right triangles.</td>
<td>G</td>
</tr>
<tr>
<td>6 Calculate the magnitude of vectors in standard position.</td>
<td>I</td>
</tr>
<tr>
<td>7 Find the direction of vectors in standard position.</td>
<td>I</td>
</tr>
<tr>
<td>8 Convert vectors in standard position between rectangular coordinate notation and polar coordinate notation.</td>
<td>I</td>
</tr>
<tr>
<td>9 Add vectors and multiply vectors by a scalar.</td>
<td>I</td>
</tr>
<tr>
<td>10 Find related acute angles for angles or vectors in quadrants.</td>
<td>E,I</td>
</tr>
<tr>
<td>11 Determine signs of trigonometric functions of angles more than 90 degrees.</td>
<td>E,I</td>
</tr>
<tr>
<td>12 Calculate unknown parts of oblique triangles.</td>
<td>F,G</td>
</tr>
</tbody>
</table>
GRADING AND EVALUATION

METHODS

Evaluation includes a combination of discussion participation, assignments, and other evaluations. Rubrics are provided for assignments and discussions.

GRADING POLICIES

Mark all module due dates on your calendar for this class. You may submit assignments AHEAD of schedule. Late assignments will not be accepted without prior approval.

Summary of Grading

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction Discussion</td>
<td>10</td>
<td>.77%</td>
</tr>
<tr>
<td>Course Navigation Quiz in D2L</td>
<td>15</td>
<td>1.15%</td>
</tr>
<tr>
<td>Practical Problems Discussions (5 @ 15 points each)</td>
<td>75</td>
<td>5.77%</td>
</tr>
<tr>
<td>Concept Application Problems Discussions (5 @ 30 points each)</td>
<td>150</td>
<td>11.54%</td>
</tr>
<tr>
<td>Pearson MyLabs Homework Assignments (10 @ 20 points each)</td>
<td>200</td>
<td>15.38%</td>
</tr>
<tr>
<td>Pearson MyLabs Quizzes (10 @ 25 points each)</td>
<td>250</td>
<td>19.23%</td>
</tr>
<tr>
<td>Pearson MyLabs Module Tests (5 @ 100 points each)</td>
<td>500</td>
<td>38.46%</td>
</tr>
<tr>
<td>Pearson MyLabs Final Exam</td>
<td>100</td>
<td>7.70%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1300</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading Scale

A = 90 to 100%    B = 80 to 89%    C = 70 to 79%    D = 60 to 69%    F = 59% and below
**Practical Problems Discussions**

You should reserve a problem from the list of problems provided and are not permitted to duplicate a problem another student has chosen. Your main post should contain a full statement of the problem, and a full solution with explanations. Your solution should be clear and grammatically correct. You are responsible for checking back with your discussion post to answer any questions from classmates or your instructor. See the Practical Problems Discussion instructions for each module and the Practical Problems Discussion Rubric for further details. (See the *Course Rubrics* link in the *Syllabus* for instructions on how to view and print the course rubrics.)

**Concept Application Problems Discussions**

Here you will have two options:

Option 1) choose to solve an application problem listed in the discussion.

Option 2) create and solve a problem from your own personal experience relating to the module concepts.

You are not permitted to duplicate a problem another student has chosen. Your main post should contain a full statement of the problem, and a full solution with explanations. Your solution should be clear and grammatically correct.

Either option you choose requires you to show or describe all steps of solving the problem. You are required to initiate a reply to at least two of your peers’ posts by addressing the question(s) in the discussion. The replies must be substantive to encourage discussion or to expand on other students' ideas. You are responsible for checking back on your discussion post to answer any questions from classmates or your instructor.

See the Concept Application Problems instructions for each module and the Concept Application Problems Rubric for further details. (See the *Course Rubrics* link in the *Syllabus* for instructions on how to view and print the course rubrics.)

**Pearson MyLabs Homework Assignments**

Your *Pearson MyLabs Homework* Assignment scores are first computed in *Pearson MyLabs* and later recorded in your D2L Gradebook.

**Pearson MyLabs Quizzes**

Your *Pearson MyLabs Quiz* scores are first computed in Pearson MyLabs and later recorded in your D2L Gradebook. Each quiz will have a question that requires you to show your work. The “Show Work” counts for 75% of the points for that question. So, if you get the correct answer but do not show your work, you will only earn 25% of the possible points on that question.
**Pearson MyLabs Pre Exams**

A Pearson MyLabs Pre Exam is available before every Module Exam. These are not scored and are optional assignments. They are an opportunity to check your understanding prior to taking the exam.

**Pearson MyLabs Module Exams and Final Exam**

Your Pearson MyLabs Module Exams and Final Exam scores are first computed in Pearson MyLabs and later recorded in your D2L Gradebook. Each exam will contain two questions that require you to show your work. The “Show Work” counts for 75% of the points for that question. So, if you get the correct answer but do not show your work, you will only earn 25% of the possible points on that question.

Your lowest Pearson MyLabs Module Exam score will be replaced with your Pearson MyLabs Final Exam score if your Final Exam score is higher. You will not see this reflected in your D2L Gradebook until after the Final Exam grades have been entered in the Gradebook.

**Optional Activities**

The Study Plan in Pearson MyLabs is optional, but we recommend that you use it when you are struggling with a topic. It will provide extra review on any topic. We have also provided Pre Exams for your benefit. These are not required but may be helpful in preparing for your "real" Exams.

**Extra Credit**

There may be the possibility of extra credit, at the point value of no more than 2% of the total course points.

**Late work/Make-up Policy**

No late work will be accepted. You may submit work ahead of time if you are unavailable at the due date. Plan ahead!
**Course Schedule**

The Schedule is subject to change as needed.

This page summarizes all of the graded assignments, discussions, quizzes, and reading assignments for the course. If you want, you can print it out and post it somewhere handy.

All assignments are described in detail on the Module Assignment pages. If you have questions check there and/or send me an e-mail.

**This course is not self-paced and is not open-exit.** All assignments, quizzes, discussions, etc., are to be completed by no later than 11:59 pm MST/MDT of the due date.

**NOTE:** Important CCCOnline semester dates (e.g., drop/withdraw/term end) appear on the [CCCOnline calendar](#).

---

**Module 1**

<table>
<thead>
<tr>
<th>Reading/Assignments/Exams</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readings Sections 3.1-4.4 in Pearson MyLabs eText</td>
<td></td>
</tr>
<tr>
<td>M1 Exploration: Exploration of Precision and Accuracy of Numbers, and Scientific and Ordinary Notation</td>
<td></td>
</tr>
<tr>
<td>M1 Quiz 1 Navigation Quiz</td>
<td></td>
</tr>
<tr>
<td>M1 Discussion 1 Student Introductions</td>
<td></td>
</tr>
<tr>
<td>M1 Assignment 1 Homework for Sections 3.1-4.4 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M1 Quiz 2 for Sections 3.1-4.4 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>Readings Sections 4.5 and 5.1-5.6 in Pearson MyLabs eText</td>
<td></td>
</tr>
<tr>
<td>M1 Discussion 2 Practical Problems</td>
<td></td>
</tr>
<tr>
<td>M1 Assignment 2 Homework for Sections 4.5 and 5.1-5.6 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M1 Quiz 3 for Sections 4.5 and 5.1-5.6 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M1 Discussion 3 Concept Applications Discussion Problems</td>
<td></td>
</tr>
<tr>
<td>M1 PreExam on Chapters 3, 4, and 5 in Pearson MyLabs [OPTIONAL]</td>
<td></td>
</tr>
<tr>
<td>M1 Exam on Chapters 3, 4, and 5 in Pearson MyLabs</td>
<td></td>
</tr>
</tbody>
</table>
**Module 2**

**Reading/Assignments/Exams**
Readings Sections 6.1-7.3 in Pearson MyLabs eText
M2 Exploration: Precision and Accuracy of Numbers and Scientific and Ordinary Notation
M2 Assignment 1 Homework for Sections 6.1-7.3 in Pearson MyLabs
M2 Quiz 1 for Sections 6.1-7.3 in Pearson MyLabs
Readings Sections 7.4-7.5 and 8.1-8.4 in Pearson MyLabs eText
M2 Discussion 1 Practical Problems
M2 Assignment 2 Homework for 7.4-7.5 and 8.1-8.4 in Pearson MyLabs eText
M2 Quiz 2 for Sections 7.4-7.5 and 8.1-8.4 in Pearson MyLabs
M2 Discussion 2 Concept Applications Discussion Problems
M2 Pre Exam on Chapters 6, 7, and 8 in Pearson MyLabs [OPTIONAL]
M2 Exam on Chapters 6, 7, and 8 in Pearson MyLabs

**Module 3**

**Reading/Assignments/Exams**
Readings Sections 9.1-10.2 in Pearson MyLabs eText
M3 Exploration: Adding, Subtracting, and Multiplying Polynomials and Monomials, and Multiplying Two Binomials Using the FOIL Method
M3 Assignment 1 Homework for Sections 9.1-10.2 in Pearson MyLabs
M3 Quiz 1 for Sections 9.1-10.2 in Pearson MyLabs
Readings Sections 10.3-11.3 in Pearson MyLabs eText
M3 Discussion 1 Practical Problems
M3 Assignment 2 Homework for 10.3-11.3 in Pearson MyLabs eText
M3 Quiz 2 for Sections 10.3-11.3 in Pearson MyLabs
M3 Discussion 2 Concept Applications Discussion Problems
M3 Pre Exam on Chapters 9, 10 and 11 in Pearson MyLabs [OPTIONAL]
M3 Exam on Chapters 9, 10 and 11 in Pearson MyLabs

**Module 4**

**Reading/Assignments/Exams**
Readings Sections 16.1-17.1 in Pearson MyLabs eText
M4 Exploration: Using Exponential Equations to Solve Finance Problems, and Circles
M4 Assignment 1 Homework for Sections 16.1-17.1 in Pearson MyLabs
M4 Quiz 1 for Sections 16.1-17.1 in Pearson MyLabs
Readings Sections 17.2-17.4 in Pearson MyLabs eText
M4 Discussion 1 Practical Problems
M4 Assignment 2 Homework for 17.2-17.4 in Pearson MyLabs eText
M4 Quiz 2 for Sections 17.2-17.4 in Pearson MyLabs
M4 Discussion 2 Concept Applications Discussion Problems
M4 Pre Exam on Chapters 16 and 17 in Pearson MyLabs [OPTIONAL]
M4 Exam on Chapters 16 and 17 in Pearson MyLabs
## Module 5

### Reading/Assignments/Exams

<table>
<thead>
<tr>
<th>Due Dates</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Readings Sections 18.1-18.2 and 19.1-19.2 in Pearson MyLabs eText</td>
<td></td>
</tr>
<tr>
<td>M5 Exploration: Pythagorean Theorem</td>
<td></td>
</tr>
<tr>
<td>M5 Assignment 1 Homework for Sections 18.1-18.2 and 19.1-19.2 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M5 Quiz 1 for Sections 18.1-18.2 and 19.1-19.2 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>Readings Sections 20.1-20.2 and 20.4-20.5 in Pearson MyLabs eText</td>
<td></td>
</tr>
<tr>
<td>M5 Discussion 1 Practical Problems</td>
<td></td>
</tr>
<tr>
<td>M5 Assignment 2 Homework for 20.1-20.2 and 20.4-20.5 in Pearson MyLabs eText</td>
<td></td>
</tr>
<tr>
<td>M5 Quiz 2 for Sections 20.1-20.2 and 20.4-20.5 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M5 Discussion 2 Concept Applications Discussion Problems</td>
<td></td>
</tr>
<tr>
<td>M5 Pre Exam on Chapters 18, 19 and 20 in Pearson MyLabs [OPTIONAL]</td>
<td></td>
</tr>
<tr>
<td>M5 Exam on Chapters 18, 19 and 20 in Pearson MyLabs</td>
<td></td>
</tr>
<tr>
<td>M5 Final Pre Exam on Module 1 - Module 5 in Pearson MyLabs [OPTIONAL]</td>
<td></td>
</tr>
<tr>
<td>M5 Final Exam on Module 1 - Module 5 in Pearson MyLabs</td>
<td></td>
</tr>
</tbody>
</table>

Last modified 8/13/2019 tlt