



## COURSE OUTLINE: OEL840 - TECHNICAL MATH II

Prepared: Mathematics Department

Approved: Lori Crosson, Director, E-Learning and Continuing Education

<b>Course Code: Title</b>	OEL840: TECHNICAL MATH II
<b>Program Number: Name</b>	
<b>Department:</b>	DISTANCE EDUCATION
<b>Semesters/Terms:</b>	20S, 20F, 21W
<b>Course Description:</b>	<p>This course is a continuation of MTH 142/OEL806 for engineering technology students. Topics of study include a more detailed view of exponents and radicals, plane analytic geometry, geometry, complex numbers, and functions including trigonometric, exponential and logarithmic functions. This course also includes an introduction to statistics.</p> <p>The goals of this course are, first to show that mathematics does play a most important role in the development and understanding of the various fields of technology and, secondly to ensure that students acquire the mathematical and critical thinking skills necessary to analyze and solve engineering technology problems.</p>
<b>Total Credits:</b>	4
<b>Hours/Week:</b>	4
<b>Total Hours:</b>	64
<b>Prerequisites:</b>	MTH142, OEL806
<b>Corequisites:</b>	There are no co-requisites for this course.
<b>Substitutes:</b>	MTH143
<b>Course Evaluation:</b>	Passing Grade: 50%, D
<b>Books and Required Resources:</b>	Basic Technical Mathematics with Calculus by Allyn J. Washington. Addison-Wesley Publisher: Pearson, Edition: 9th or 10th Edition ISBN: 0133523667

<b>Course Outcomes and Learning Objectives:</b>	<b>Course Outcome 1</b>	<b>Learning Objectives for Course Outcome 1</b>
	Complex Numbers (Students in Electrical/Electronics/Computer programs should complete this topic)	<ul style="list-style-type: none"><li>-Write complex numbers in rectangular, polar, trigonometric and exponential forms</li><li>-Graph complex numbers in both rectangular and polar form</li><li>-Find the sum, differences, products, quotients, powers and roots of complex numbers</li></ul>
	<b>Course Outcome 2</b>	<b>Learning Objectives for Course Outcome 2</b>
	Geometry (Students in Civil/Environmental/Construction programs should complete this topic)	<ul style="list-style-type: none"><li>-Solve practical problems to find the sides and angles of right triangles</li><li>-Solve practical problems to find the areas of a triangle or quadrilateral</li><li>-Solve problems involving the circumference, diameter, area tangent to a circle</li><li>-Compute surface areas and volumes of spheres, cylinders, cones and other solid figures</li></ul>



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	<b>Course Outcome 3</b>	<b>Learning Objectives for Course Outcome 3</b>
	Variation	-Review ratio and proportion -Study direct, inverse and joint variation
	<b>Course Outcome 4</b>	<b>Learning Objectives for Course Outcome 4</b>
	Exponents and Radicals	-Use the laws of exponents to simplify and combine expressions having integral exponents -Simplify radicals by removing perfect powers and by rationalizing the denominator -Add, subtract, multiply, and divide radicals
	<b>Course Outcome 5</b>	<b>Learning Objectives for Course Outcome 5</b>
	Graphs of Trigonometric Functions	-Find the amplitude, period, frequency and phase angle for a sine wave or cosine wave -Write the sine function or cosine function, given the amplitude period and phase -Graph the sine function, cosine function or tangent function
	<b>Course Outcome 6</b>	<b>Learning Objectives for Course Outcome 6</b>
	Exponential and Logarithmic Functions	-Define the logarithmic and exponential function -Graph logarithmic and exponential functions -Convert expressions between exponential and logarithmic form -Evaluate, manipulate and simplify logarithmic expressions -Solve exponential and logarithmic equations
	<b>Course Outcome 7</b>	<b>Learning Objectives for Course Outcome 7</b>
	Additional Topics in Trigonometry	-Simplify a trigonometric expression using the fundamental identities -Prove trigonometric identities using the fundamental identities -Simplify expressions or prove identities using the sum or difference formula or double-angle formula -Solve trigonometric equations -Evaluate inverse trigonometric functions
<b>Evaluation Process and Grading System:</b>	<b>Course Outcome 8</b>	<b>Learning Objectives for Course Outcome 8</b>
	Plane Analytic Geometry	-Write the equation of a line using the slope-intercept form, the point-slope form or the two-point form -Write the equation of a circle, ellipse, parabola or hyperbola from given information -Make a graph of any of the above conic sections
	<b>Course Outcome 9</b>	<b>Learning Objectives for Course Outcome 9</b>
	Basic Statistics	-Organize data into frequency distributions, frequency histograms or frequency polygons -Calculate the mean, median and mode -Calculate the range and standard deviation -Calculate the best fit curve (linear regression)
	<b>Evaluation Type</b>	<b>Evaluation Weight</b>
	FINAL EXAM	48%
	TESTS (4)	52%

<b>Date:</b>	March 9, 2020
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<b>Addendum:</b>	Please refer to the course outline addendum on the Learning Management System for further information.
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