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MATHEMATICS

Mechanical Technician  
Civil/Construction Tech: .LIQIJ i  
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MIH 27S-4

;" "•;\ /> Cp (j June, 1981 by E. Maki

MATH

MTH 271-A

Calculus                    analytic Geometry - Person

Technical Math with Calculus    Rice & Knight

Calculus with Analytic Geometry - Green

Calculus and Its Application - Douglass & Seldin

Calculus - Schauta's College Outline Series

Technical Math for Engineering & Science                    i. i. f. c. - t. o.

Calculus for Electronics - Richmond

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(1) Time Objective:

(a) The student is expected to complete all of the MOK-OPTIGNA: 100iCS course consisting of one semester (approximately 2 weeks), prior to the start of the semester in which the student takes the requisite mathematics course.

(b) The student will be given instruction in the classroom or in an equivalent setting as per one of the periods specified by the syllabus of the last two semesters. Normally a topic test will be given.

Topic is at the discretion of the instructor and should not exceed 2 periods, or less, in any given topic. Such tests should be as few and as small as possible.

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 MTH 278-4 ! 'i^Uaca^Uc^r :. Chemisurv ! -L -- CU

NOTES :

Student beginning this course should hav ;ietec satrsrac  
 the algebra, triccnometry and analytic c -v of MTH 125,  
 MTH 251 or MTH 253 or MTH 254.

2. r'ornulas should be Drowed (some as exercises :udents)  
 and then through use become )aru or eac.n • pnr ← sematica.  
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Practical applications from major subject nelcs snouic oe us;  
 whenever oossible.

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course suffer.

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TOPICAL 03,

Topic - Introduction

The student is expected to learn the meaning of a function, functional notation, the process of differentiation to various functions.

Reference DV files:

The student will be required to derive and use the following differentiation formulae:

- (a) The Power Rule (Power of a Variable)
- (b) The Chain Rule (Power of a polynomial in one variable)
- (c) The Product Rule
- (d) The Quotient Rule

Also, the student should be able to find the derivative of a function by inversion.

- (a) A function by inversion

Topic - Applications of Derivatives

The student will be required to find the derivatives in order to:

- (a) Gradient of a curve
- (b) Equation of tangents to any curve
- (c) Maximum and minimum points on a curve whose equation is known, using the slope test, 2nd derivative test and/or the nature test
- (d) A maximum or minimum value
- (e) An unknown time related rate when rate of change is specified.
- (f) The solutions to related subject are

Topic - Related Rates

The student should be able to:

- (a) find the rate of change of one quantity when the rate of change of another quantity is given
- (b) use differentiation to solve problems involving related rates

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- (a) Th; intecrction is anti-c: nation, anc now  
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ir i~zscrs1 anc new to zmo  
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- (C) riow "co apply ir^scrcii techniques to acceleration,  
velocity and cistc.ice
- (d) How to use integration solve electronic crcbiems  
(El students only)

eooc 6. - The Definite Integral

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- (a) Tne \_ • u^-ac i-Lwi:
- (b) Defin ^ d b v ~ n^B ^ taj.cu.

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- (a) Area "under-a-curve", for simple pciync
- (b) Area between two curves, for simple po.
- (c) Areas by the trapezoid rule
- (d) Mean value of a function (newer)

Tooic i lore .on:

The student wi ll be ^~ecu ~ r ed t o f i n c :

- (a) Volumes of revolution by integration (shell and disc method)
- (b) Work done by electrical forces
- (c) Solutions to aoclied electronic problems (Electronic Technology oniv)

topics 8 £ S - If time Dermics, "Trans; 'Fnc P" "unctions anc  
KyperocLic Functions snouuc oe iearnec as tney are  
roken down into sub-headings on the last pace of en:  
course outline.

series	;0?:c uesr:::	
(8-10)	Introduction to <u>Calculus</u> Functional notation, limiting value <u>ce.ita metn</u> <sup>DC</sup>	rorsor. Ch. S...
	Independent: $DV = u_e$ Differentiation: $ion icrmuia$ ; Composite functions and chain rule Implicit differentiation	P
	Practical Applications of Differentiation Examples	P 18,20
	Related rates (Electrical and Electronic!) Practical Applications	
	Further Differentiation Successive differentiations Velocity. Derivatives of $tr^{n^c}$ Functions Differentials	P. 1=>^i
	<u>Introduction to Integration</u> Relationship to differentiation Indefinite integration, Accelerated motion Example: application (Electronic only)	P
	<u>The Definite Integral</u> Integration as a sum, summation, notation	ielectric Circuits P f.f.r =
	Fundamental theorem of integral calculus Area under a curve, area between curves Trapezoid rule Mean value of a function (tower)	
	More Applications of : _____ Volumes by integration Work, done by electric forces Electronic applications	

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 Differentiation and integration ? . ~ < f . --  
 of trigonometric functions, expon-  
 ential and logarithmic functions ? . 31,2;  
 Inverse Trigonometric functions  
 Ancular velocity and acceleration

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 Definition ci j:ii  
 Different!  
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