SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. KARIE, ONTARIO

COURSE OUTLINE

COURSE TITLE: TECHNICAL MATHEMATICS

CODE NO.: MTH654-4 **SEMESTER:** III

PROGRAM: AVIATION TECHNOLOGY AND PILOT TRAINING

AUTHOR: W. MACQUARRIE

DATE: JULY 1991 **PREVIOUS OUTLINE DATED:** JUNE 1989

APPROVED: DEAN DATE

TECHNICAL MATHEHATICS **MTH654-4**

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TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH626-4

I. PHILOSOPHY/GOALS:

1) Review the analytic geometry of the straight line and conic sections.

2) Study various methods of finding empirical equations from raw lab data.

3. Formatting and use of graphical aircraft performance charts as found in Cessna and Piper Aircraft operators' manuals.

4. Review derivatives of trig, log and exponential functions.

5. Methods of integration (continued from MTH626),

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will be able to:

1. Layout graphs and find the general equations of various straight lineS/ circles, parabola, etc.

2. Find the empirical equations for any set of raw lab data by various methods.

3. Create and/or use multiline graphs to determine flight parameters of the Piper Twin Commanche.

4. Differentiate and integrate various trig, log exponential and other functions.

III. TOPICS TO BE COVERED:

1. Analytic Geometry.
2. Empirical Equations.
3. Twin Commanche Performance Graphs.
4. Derivatives of Trig, Log Exp. Functions
5. Methods of Integrating Trig, Log Exp. Functions, etc.

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IV- LEARNING ACTIVITIES		**REQUIRED RESOURCES**
Topic No.	PERIODS DESCRIPTION	
	ANALYTIC GEOMETRY - •Properties, formulae and applications of the straight line, circle. parabola ellipse, and hyperbola.	Washington Text - Chapter 1 Page 1-58 Problems from: Exercises 1-3 P.16 Exercises 1-4 P.21,22,24 Exercises 1-5 P.28 Exercises 1-6 P.33,34 Exercises 1-7 P.39,40 Exercises 1-9 P.50,52 Exercises 1-10 P.56,58
11	EMPIRICAL EQUATIONS - •Linear empirical equations Two point method •Non-linear empirical equations General polynomial function Power function •2-pt method •Method of averaging logs •Graphical method •Preparation of engi-neering graphs single and multiline.	Handout Notes •- Teacher Assigned Problems, Assignments
	GRAPHICAL PERFORMANCE CHARTS - -Reading graphical charts -Normal critical path through multi-graph charts -Interpolation in multiline graphs -Reverse path through multi-graph charts -Double entry into multi-graph charts -Simulated flight planning.	Piper Aircraft Twin Commanche Manual Teacher Assigned Flight Planning Projects

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IV LEARNING ACTIVITIES: (cont'd) **REQUIRED RESOURCES:**

Topic No.	PERIODS	DESCRIPTION	
		REVIEW OF DERIVATIVES OF EXPONENTIAL AND LOGARITHMIC FUNCTIONS -	Washington Text - Chlapt Pages 238-301 Problems from:
		•Exponential and log functions	Exercises 6-2 p.253
		•Derivatives of logarithmic functions	Exercises 6-3 p.258
		'Derivatives of exponential functions	Exercises 6-4 p.262
		•Application of above	Exercises 6-4 p.272
			Exercises 7-1 p,286
			Exercises 7-2 p.291--2
			Exercises 7-3 p.295
			Exercises 7-4 p.298
			Review Exercises
	18	METHODS OF INTEGRATION -	Washington, Chapter 8
		•Power Formula	Exercise 8-1 p.304,305
		•Basic logarithmic form	Exercise 8-2 p.307,308
		•Exponential form	Exercise 8-3 p.311
		Various trigonometric forms	Exercise 8-4 p.315
			Exercise 8-5 p.320
			Exercise 8-6 p.324
			Review Exercises

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V. METHOD OF EVALUATION:

The student will be assessed by written tests, including up to five major periodic announced tests based on large blocks of subject matter, and several unannounced short quizzes on current work, the latter being given at the discretion of the instructor- Up to two assignments on empirical equations and/or aircraft graphs may be included in the course, A final test on the entire course may also be included, counting up to 30% of the final semester grade. A letter grade will be determined based upon an average of the above.

GRADING:

A+	» 90 - 100%
A	- 80 - 89%
B	- 65 - 79%
C	- 55 - 64%
I, X or R	« less than 55%**

** See also the "MATH DEPT. EVALUATION GUIDELINES" publication for complete procedures and policies.

VI. REQUIRED STUDENT RESOURCES:

Technical calculus with Analytic Geometry; A,J. Washington, 3rd edition ~ Benjamin Cummings.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY BOOK SECTION:

None available.

VIII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.