

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY  
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: MATHEMATICS  
Code No.: MTH 654-4  
Program: AVIATION  
Semester: III  
Date: SEPTEMBER, 1986  
Author: W. MACQOARRIE

New

Revision:

APPROVED

  
C|v5Trpjirs^5r^

Date ^^J^^M.

MATHEMATICS

MTH 654-4

Course Name

Course Number

PHILOSOPHY/GOALS;

When the student has successfully completed this course he/she will have demonstrated an acceptable ability to pass tests based upon the course content as listed elsewhere. If, after completing the course, the student takes further courses (or employment) in which he/she is required to apply this material he should then, through practice, be able to develop a good command of this subject matter.

METHOD OF ASSESSMENT (GRADING METHOD);

The students will be assessed by three to five tests. The tests will be periodic tests based upon blocks of subject matter. Also, at the instructors discretion, unannounced surprise quizzes on current work and/or a final test on the whole course may be given. A letter grade will be based upon a student's weighted average of his/her test results. See also the mathematic's department annual publication "TO THE MATHEMATICS STUDENT" for further details. This publication is made available to the students early in each academic year.

TEXTBOOK(S):

TECHNICAL CALCULUS WITH ANALYTIC GEOMETRY; A.J. Washington  
- Benjamin Cummings

OBJECTIVES;

The basic objective is for the student to develop an understanding of the methods studied, knowledge of the facts presented and an ability to use these in the solution of problems. For this purpose exercises are assigned. Tests will reflect the sort of work contained in the assignments. The level of competency demanded is the level required to obtain an overall passing average on the tests. The material to be covered is:

1. A review of analytical geometry of straight lines and conic sections.
2. Procedures for finding linear and non-linear empirical equations.
3. Interpolations of tabulated numerical data.
4. The use of graphical aircraft performance charts.

- 5\* Finding derivatives of exponential and logarithmic functions and using them in applied problems,
6. Various methods of integration and applications.
7. Preparation of performance graphs.

AVIATION MATHEMATICS - MTH 654-4

TOPIC NO	PERIODS	TOPICS	REFERENCES
		Analytic Geometry (Review)	para. 1.5-1,8, 1.10, 1.11
		<u>Empirical Equations (Aviation Only)</u>	Rice and Knight 2nd Ed. Ch. 6 p. 334-352
		Linear empirical equations Non-Linear empirical equations	
3	2	<u>Interpolation (Aviation only)</u> (tabulated performance charts)	any 4 place log and trig table
		Review basic interpolation trends in tabulated data (4 place logarithm and natural trig tables) Use of Aviation CR-3 type computers in interpolation (proportions) Multiple interpolation procedures Practical problems in assorted performance tables (take-off landing, climb and cruise performance charts)	Cessna 172M 180, 182 Flight Manuals
4	5	<u>Graphical (Performance Charts)</u> (Aviation only)	Cessna 172M & Piper Twin Comanche Flight Normal
		Reading graphical charts critical path through multiple graph charts Reverse path through multi-graph charts given conditions Practical problems	
	14	<u>Derivatives of the Exponential and Logarithmic Functions</u>	251-268 Ch. 7
		Exponential and Logarithmic functions Derivative of logarithmic functions Derivative of exponential functions	
	21	<u>Methods of Integration</u>	269-3&1
		Power Formula Basic logarithmic form The exponential form Various trigonometric forms Integration by parts	

AVIATION MATHEMATICS 2. MTH 654-4

TOPIC NO.	PERIODS	TOPICS	REFERENCES
^	3	<u>Ci^aph Preparation (Aviation only)</u> (OPTIONAL IF TIME PERMITS)  Procedures for making engineering Selection of axis, names, labelling techniques Multiline graphs from tabulated performance charts Interpolation in multiline graphs Winds aloft graph on CR-3 computer Practical assignments	Cessna 172M     Piper Twin Commanche