

THE SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY  
SAULT STE. MARIE, ON



COURSE OUTLINE

Course Title: Technical Mathematics

Code No.: MTH 626-4

Semester: Three

Program: Aviation

Author: The Mathematics Department

Date: August 2001

Previous Outline Dated: August 2000

Approved: \_\_\_\_\_  
Dean

\_\_\_\_\_  
Date

Total Credits: 3

Prerequisite(s): MTH613

Substitutions: MTH577

Length of Course: 4 hrs./week

Total Credit Hours: 64

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(705) 759-2554, Ext. 516*

Technical Mathematics  
**Course Name**

MTH 626-4  
**Code No.**

### **I. COURSE DESCRIPTION:**

This course is a continuation of MTH 613 (a beginning calculus course). It includes differentiation and integration of algebraic, trigonometric and inverse trigonometric functions, exponential and logarithmic functions and applications of these. It is intended to give the student a mathematical understanding of many topics that arise in other courses and in MTH 654 (next semester Calculus course).

### **II. STUDENT PERFORMANCE OBJECTIVES:**

The basic objective is for the student to develop an understanding of the methods studied, knowledge of the facts presented and 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 in the tests. The material to be covered is listed below.

### **III. TOPICS TO BE COVERED:**

#### **Approximate Time Frame**

- |  |          |
|--|----------|
| 1. Applications of Integration, including indefinite integrals, areas, volumes, centroids, moments of inertia, work and pressure in liquids. | 20 hours |
| 2. Derivatives of Trig. and Inverse Trig Functions   | 20 hours |
| 3. Derivatives of Exponential and Logarithmic Functions  | 20 hours |

**IV. LEARNING ACTIVITIES:**

TOPIC NUMBER	NO. OF PERIODS	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1	15	APPLICATIONS OF INTEGRATION  Applications of indefinite integral Areas of integration Volumes of integration Centroids Moments of inertia Work and liquid pressure	Chapter 26  Exercise 26.1 Odds Exercise 26.2 Odds Exercise 26.3. Odds Exercise 26.4 Odds Exercise 26.5 Odds Exercise 26.6 Odds Exercise 26.7 Odds
2	17	TRIGONOMETRIC AND INVERSE FUNCTIONS  Review of basic trig. relations, graphs, identities Derivatives of sine and cosine functions Derivatives of other trigonometric functions Inverse trigonometric functions and derivatives Applications	Chapters 20 & 27  Chapter 20, Exercises 20.1, 20.2, 20.3, 20.4, 20.5, 20.6 Exercise 26.1 Odds Exercise 26.2 Odds  Exercise 26.3 Odds  Exercise 26.4
3	17	EXPONENTIAL AND LOGARITHMIC FUNCTIONS  Review rules for exponents and logarithms. Derivatives of logarithmic functions Derivatives of exponential functions Applications	Chapters 11, 13 & 27  Exercise 11.1, 11.2, 13.1, 13.3 Exercise 26.5 Odds Exercise 26.6 Odds Exercise 26.7 Odds Exercise 26.8

The student will be expected to attend all classes punctually and do all the assigned work.

Work will be assigned from the previously listed exercises in the textbook.

At the discretion of the instructor, other exercises in the textbook may be used and work may be assigned from handouts supplied by the instructor.

## V. REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Text: "Basic Technical Mathematics with Calculus", Washington, Alan J, Metric Ed., 7<sup>th</sup> Edition, Benjamin Cummings.
2. Calculator: (Recommended) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

## VI. EVALUATION PROCESS/GRADING SYSTEM:

### MAJOR ASSIGNMENTS AND TESTS

While regular tests will normally be scheduled and announced beforehand, there may be an unannounced test on current work at any time. Such tests, at the discretion of the instructor, may be used for up to **30%** of the overall mark.

At the discretion of the instructor, there may be a mid-term exam and there may be a final exam, each of which can contribute up to **30%** of the overall mark.

The instructor will provide you with evaluation information for your class section. Tests may be scheduled out of regular class time.

### ATTENDANCE

It is your responsibility to attend all classes during the semester. Research indicates there is a high correlation between attendance and student success.

If you are absent from class, it is your responsibility to find out what work was covered and assigned and to complete this work before the next class. Your absence indicates your acceptance of this responsibility.

**Unexcused absence from a test may result in a mark of zero ("0").** Absence may be excused on compassionate grounds such as verified illness or bereavement. On return from an excused absence, you should ask your instructor to schedule the writing of a make-up test. Failure to do so will be considered as an unexcused absence.

**VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):  
METHOD OF ASSESSMENT (GRADING METHOD)**

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	Consistently outstanding (90% - 100%)	4.00
A	Outstanding achievement (80% - 89%)	3.75
B	Consistently above average achievement (70% - 79%)	3.00
C	Satisfactory or acceptable achievement in all areas subject to assessment (60% - 69%)	2.00
R	Repeat - The student has not achieved the objectives of the course, and the course must be repeated. (less than 60%)	0.00
X	A temporary grade, limited to situations with extenuating circumstances, giving a student additional time to complete course requirements	
CR	Credit exemption	

The method of calculating your weighted average will be defined by your instructor. Since grades are based upon averages, it follows that good marks in some tests can compensate for a failing mark in another test.

**Make-Up Test (if applicable)**

An "X" grade may be assigned at the end of the regular semester if you have met ALL of the following criteria:

- an overall average between 50% and 59% was achieved
- at least 50% of the tests were passed
- at least 80% of the scheduled classes were attended
- at least 80% of quizzes and assignments were submitted
- all of the topic tests were written

If you are assigned an "X" grade, you may convert it to a "C" grade by writing a make-up test on topics agreed to by the instructor. This test will be available at the time agreed to by your instructor.

At the end of the regular term, it is your responsibility to obtain your results from your instructor and, in the event of an "X" grade, to inquire when the make-up test will be available.

The score you receive on this make-up test will replace your original test score and be used to re-calculate your weighted average. If the re-calculated average is 60% or greater, a "C" grade will be assigned. If the re-calculated average is 59% or less, an "R" grade will be assigned.

**VI. EVALUATION PROCESS/GRADING SYSTEM (Continued):****“R” and “X” Grades at the end of the Semester**

If an “X” grade is not cleared by the specified date, it will become an “R” grade. Except for extenuating circumstances, an “X” grade in Math will not be carried into the next semester.

**“R” Grades during the Semester**

A student with a failing grade and poor attendance (less than 80% attendance) may be given an “R” at any time during the semester.

**VII. SPECIAL NOTES:**

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities), are encouraged to discuss required accommodations with the professor and/or contact the Special Needs Office.

**Advanced Standing**

Students who have completed an equivalent post-secondary course must bring relevant documents to the Coordinator, Mathematics Department:

- a copy of course outline
- a copy of the transcript verifying successful completion of the equivalent course

Note: A copy of the transcript must be on file in the Registrar’s Office.

**VIII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult the instructor or the Prior Learning Assessment Office (E2203).