**SAULT COLI^GE OF APPLIED ARTS & TECHNOLOGY**

**SAULT STE. MARIE. ONTARIO**

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| **COURSE TITLE:** | TECHNICAL MATHEMATICS |
| **CODE NO.:** | MTH 613-4  **SEMESTER:** II |
| **PROGRAM:** | AVIATION |
| **AUTHOR:** | W.O. MAKI |
| **DATE:** | JUNE 1996  **PREVIOUS OUTLINE DATED:** JAN 1996 |

**APPROVED:** ~~Judith~~ h₁^-f/V^
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r DATE

Technical Mathematics                                    MTH 613-4

COURSE NAME                                              CODE NO,

TOTAL CREDIT HOURS:  64

PREREQUISITE:  NONE

SUBSTITUTE(S):  MTH 551

L  PHILOSOPHY/GOALS:

The course includes topics in Plane Analytic Geometry, introduction to Calculus including derivatives and integration of algebraic functions; applications of differentiation and simple integration.

## 11. STUDENT PERFORMANCE OBJECTIVES:

The basic objectives are that the student develop an understanding of the methods studied, demonstrate a knowledge of the facts presented and show an ability to use these in the solution of problems.  To accomplish these objectives, exercises are assigned.  Test questions will be of near equal difficulty to questions assigned in the exercises.  The level of competency demanded is the level required to obtain an overall passing average on the tests.  The material to be covered is listed below and on the followmg page:

## in. TOPICS TO BE COVERED:

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|---|---|---|
| (1) | Plane Analytic Geometry of straight lines, and conic sections including equations, properties and graphing of each. | 12 hrs. |
| (2) | Derivative Calculus including functions, notations, limits, slopes of secants/tangents, delta method, derivative rules, composite and implicit functions and higher order differentiation. | 14 hrs. |
| (3) | Derivative Applications including slopes of tangents, normals and curves, curvilinear motion, related rates, curve sketching and maximum/minimum applications. | 14 hrs. |
| (4) | Integral Calcuhis involving differentials, anti-derivatives, indefinite, particular and definite integration areas. | 14 hrs. |

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## IV. LEARNING ACTIVITIES:

| TOPIC | PERIODS | TOPIC DESCRIPTION | REFERENCES |
|---|---|---|---|
| 3. | 14 | Applications of Derivatives | Ch.24 |
| | | 3.1 Tangents and Normals | Ex. 24.1: Odds 1-19 |
| | | 3.2 Curvilinear motion | Ex. 24.3: Odds 1-17 |
| | | 3.3 Related rates | Ex. 24.4: Odds 1-21 and handout |
| | | 3.4 Curve sketching | Ex. 24.5: Odds 1-25 |
| | | 3.5 Maximum/minimum applications | Ex. 24.7; Odds 1-27 |
| 4. | 14 | Integration | Ch. 25 & 26 |
| | | 4.1 Differentials | Ex. 25.1: Odds 1-25 |
| | | 4.2 Antiderivatives | Ex. 25.2: Odds 1-29 |
| | | 4.3 Indefinite integral | Ex. 25.3: Odds 1-43 |
| | | 4.4 Definite integrals | Ex. 25.5: Odds 1-35 |
| | | 4.5 Area under a curve and area between two curves | Ex. 26.2: Odds 1-31 |

**3**

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 m 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.

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## V. EVALUATION METHODS: (cont'd)

As in any other subject the student is preparing for his working career as well as stud)dng the subject. Hence, on tests the student is expected to produce neat, legible, well laid out solutions which show clearly how the answers were obtained. If anything less is required, this will be indicated in the test. Failure to show such solutions may render correct answers worthless. As happens in the workplace if anything you put on paper can be misread it adU be. In addition to loss of marks on individual questions, up to 25% of the marks available on a test can be subtracted as a penalty for untidiness. Marks lost in such penalties can be redeemed by a student willing to put forth the required effort. Proper solutions as described above should be produced for all your assigned work. Such practice will make it easier for you to produce the required quality of work on tests. If when you look at a page of your work it makes you feel proud of Its appearance, than you are probably on target.

Marks allotted to each question on a test are usually shown. Please enquire if they are not. The questions on a test do not necessarily have equal values.

Full attendance at all scheduled classes is required. Any student with unexcused absences exceeding 10% of the classes will have his math grade reduced, provided that this does not reduce the grade below a "C".

## VI. REQUIRED STUDENT RESOURCES:

1. TEXT: Basic Technical Mathematics with Calculus, Washington, Alan J.. 6th (metric) Ed., Benjamin Cummings, 1995.

2. CALCULATOR: (Recommended) SHARP Scientific Calculator EL-531G. The use of some kinds of calculators may be restricted during tests.

## VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabihties) 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.