

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

| | | | |
|-------------------------|------------------------------|--------------------------------|--------------|
| COURSE TITLE: | Technical Mathematics | | |
| CODE NO. : | MTH 613-4 | SEMESTER: | Two |
| PROGRAM: | Aviation Technology - Flight | | |
| AUTHOR: | The Mathematics Department | | |
| DATE: | January 2013 | PREVIOUS OUTLINE DATED: | January 2012 |
| APPROVED: | "Colin Kirkwood" | | Dec/12 |
| | <hr/> | | |
| | | DEAN | DATE |
| TOTAL CREDITS: | 4 | | |
| PREREQUISITE(S): | MTH 612 | | |
| HOURS/WEEK: | 4 | | |

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I. COURSE DESCRIPTION:

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

II. TOPICS TO BE COVERED:

hours allotted

- | | |
|---|----------|
| 1. Plane Analytic Geometry of straight lines and conic sections including equations, properties, and graphing of each | 16 hours |
| 2. Derivative calculus including functions, notations, limits, slopes of secants/tangents, delta method, derivative rules, composite and implicit functions, and higher order differentiation | 16 hours |
| 3. Derivative applications including slopes of tangents, normals and curves, curvilinear motion, related rates, curve sketching, and maximum/minimum applications | 16 hours |
| 4. Integral calculus involving differentials, anti-derivatives, indefinite and definite integration, areas and volumes | 16 hours |

III. LEARNING ACTIVITIES:

| TOPIC NUMBER | TOPIC DESCRIPTION | REFERENCE CHAPTER ASSIGNMENTS |
|---------------------|---|--|
| 1.0 | Plane Analytic Geometry | Chapter 21 |
| 1.1 | Straight line, slope, graphs, length, and intersections | Exercise 21.1& Ex. 21.2 |
| 1.2 | Circle | Exercise 21.3 & Ex. 21.7 |
| 1.3 | Parabola | Exercise 21.4 Exercise 21.7 |
| 1.4 | Ellipse and Hyperbola | Exercise 21.5 to Ex. 21.8 Review Exercise and Handout |
| 2.0 | The Derivative | Chapter 23 |
| 2.1 | Functional notation | Exercise 3.1 |
| 2.2 | Limits | Exercise 23.1 |
| 2.3 | Derivative – delta method | Exercise 23.3 & Ex. 23.4 |
| 2.4 | Derivative of polynomial by rule | Exercise 23.5 |
| 2.5 | Product and quotient rule | Exercise 23.6 |
| 2.6 | Composite functions – chain rule | Exercise 23.7 |
| 2.7 | Implicit functions | Exercise 23.8 |
| 2.8 | Higher derivatives | Exercise 23.9 Review exercise as required |
| 3.0 | Applications of Derivatives | Chapter 24 |
| 3.1 | Tangents and normals | Exercise 24.1 |
| 3.2 | Curvilinear motion | Exercise 24.3 |
| 3.3 | Related rates | Exercise 24.4 and Handout |
| 3.4 | Curve sketching | Exercise 24.5 & Ex. 24.6 |
| 3.5 | Maximum/minimum applications | Exercise 24.7 Review Exercises |
| 4.0 | Integration | Chapters 25 & 26 |
| 4.1 | Differentials | Exercise 24.8 |
| 4.2 | Antiderivatives | Exercise 25.1 |
| 4.3 | Indefinite integral | Exercise 25.2 |
| 4.4 | Definite integrals | Exercise 25.4 |
| 4.5 | Applications of the indefinite integral | Exercise 26.1 |
| 4.5 | Area under a curve and area between two curves | Exercise 25.3 26.2 |
| 4.6 | Volumes by integration | Exercise 26.3 and Handout |

IV. REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Basic Technical Mathematics with Calculus, Washington, Allyn J. 9th (metric) Edition, Pearson Canada.
2. Calculator: (*Recommended*) SHARP Scientific Calculator EL-531W. **Note:** *The use of some kinds of calculators may be restricted during tests.*

V. EVALUATION PROCESS/GRADING SYSTEM:

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.

METHOD OF ASSESSMENT (GRADING METHOD)

The following semester grades will be assigned to students:

| Grade | <u>Definition</u> | <i>Grade Point Equivalent</i> |
|--------------|--|--------------------------------------|
| A+ | 90 – 100% | 4.00 |
| A | 80 – 89% | 3.00 |
| B | 70 - 79% | 2.00 |
| C | 60 - 69% | 1.00 |
| D | 50 – 59% | 0.00 |
| F (Fail) | 49% and below | |
| CR (Credit) | Credit for diploma requirements has been awarded. | |
| S | Satisfactory achievement in field /clinical placement or non-graded subject area. | |
| U | Unsatisfactory achievement in field/clinical placement or non-graded subject area. | |
| X | A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. | |
| NR | Grade not reported to Registrar's office. | |
| W | Student has withdrawn from the course without academic penalty. | |

| Course: MTH 613 | | |
|--------------------------|---|----------------------------------|
| Evaluation Device | Topics Covered (reference topic numbers from the course outline) | % weight of Final Average |
| Test 1 | 1 | 25% |
| Test 2 | 2 | 25% |
| Test 3 | 3 | 25% |
| Test 4 | 4 | 25% |

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal, form part of this course outline.