

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ONTARIO



COURSE OUTLINE

COURSE TITLE: **Technical Mathematics**

CODE NO. : **MTH 654-4** **SEMESTER:** **Winter**

PROGRAM: **Aviation Technology and Pilot Training**

AUTHOR: **The Mathematics Department**

DATE: **January PREVIOUS OUTLINE DATED: January**
 2010 **2009**

APPROVED:

	CHAIR	DATE
TOTAL CREDITS: 4		
PREREQUISITE(S): MTH 626-4		
HOURS/WEEK: 4		

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*For additional information, please contact Brian Punch, Chair,
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(705) 759-2554, Ext.2681*

I. COURSE DESCRIPTION:

This course will:

1. Study methods of integration.
2. Study Maclaurin, Taylor, and Fourier series.
3. Study first and second order differential equations.

II. LEARNING OUTCOMES:

Learning Outcomes:

Upon successful completion of this course, students will demonstrate the ability to:

1. Integrate trigonometric, logarithmic, and exponential functions and apply results.
2. Generate and evaluate Maclaurin and Taylor series for various functions and apply results.
3. Solve some types of first and second order differential equations and apply results.

III. TOPICS:

Hours Allotted

- | | |
|---------------------------|----|
| 1. Methods of integration | 20 |
| 2. Infinite series | 15 |
| 3. Differential equations | 25 |

TOPIC NUMBER	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
1.0	Methods of Integration	Chapter 28
1.1	General Power formula	Exercise 28-1
1.2	Basic logarithmic form	Ex. 28-2
1.3	Exponential form	Ex. 28-3
1.4	Various trigonometric forms	Ex. 28-4 Ex. 28-5 Ex. 28-6
1.5	Integration by parts	Ex. 28-7
1.6	Integration by trigonometric substitutions	Ex. 28-8
1.7	Integration by partial fractions	Ex. 28-9, 28-10

1.8	Integration by use of tables	Ex. 28-11 Review exercises
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TOPIC NUMBER	TOPIC DESCRIPTION	REFERENCE CHAPTER ASSIGNMENTS
2.0	Expansion of functions in series	Chapter 29
2.1	Infinite series	Ex. 29 -1
2.2	Maclaurin Series	Ex. 29-2
2.3	Certain operations with series	Ex. 29-3
2.4	Taylor series	Ex. 29-5
2.5	Fourier Series	Ex. 29-6, 29-7
3.0	Differential equations	Chapter 30
3.1	Solutions of DEs	Ex. 30-1
3.2	Separation of variables	Ex. 30-2
3.3	Integrating combinations	Ex. 30-3
3.4	Linear DEs of first order	Ex. 30-4
3.5	Elementary applications	Ex. 30-5
3.6	Second order homogenous DEs	Ex. 30-6
3.7	Auxiliary equations with repeated or complex roots.	Ex. 30-7
3.8	Solutions of non-homogenous DE's	Ex. 30-8
3.9	Applications of second order DEs	Ex. 30-9
3.10	Laplace transforms	Ex. 30-10
3.11	Solving DE's by Laplace transforms	Ex. 30-11
3.12	Review exercise	

IV. REQUIRED RESOURCES / TEXTS / MATERIALS:

1. Basic Technical Calculus with Analytic Geometry, A. J. Washington, 8th Edition, Benjamin Cummings
2. Calculator: (Recommended) SHARP Scientific Calculator EL-531W. ***The use of some kinds of calculators may be restricted during tests.***

V. EVALUATION PROCESS/GRADING SYSTEM:

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.

METHOD OF ASSESSMENT (GRADING METHOD)

The following semester grades will be assigned to students:

Grade	Definition	Grade Point Equivalent
A+	90 – 100%	4.00
A	80 – 89%	
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% and below	0.00
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 654		
Evaluation Device	Topics Covered (reference topic numbers from the course outline)	% weight of Final Average
Test 1	1	33%
Test 2	2, 3.1 -3.3	33%
Test 3	3.4-3.12	34%

VI. SPECIAL NOTES:

Course Outline Amendments:

The professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Retention of Course Outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

Substitute course information is available in the Registrar's office.

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in Student Code of Conduct. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

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.