

**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

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| **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 30 |
| 2.1 | Infinite series | Ex. 30 -1 |
| 2.2 | Maclaurin Series | Ex. 30-2 |
| 2.3 | Certain operations with series | Ex. 30-3 |
| 2.4 | Taylor series | Ex. 30-5 |
| 2.5 | Fourier Series | Ex. 30-6, 30-7 |
| **3.0** | **Differential equations** | **Chapter 31** |
| 3.1 | Solutions of DEs | Ex. 31-1 |
| 3.2 | Separation of variables | Ex. 31-2 |
| 3.3 | Integrating combinations | Ex. 31-3 |
| 3.4 | Linear DEs of first order | Ex. 31-4 |
| 3.5 | Elementary applications | Ex. 31-6 |
| 3.6 | Second order homogenous DEs | Ex. 31-7 |
| 3.7 | Auxiliary equations with repeated or complex roots. | Ex. 31-8 |
| 3.8 | Solutions of non-homogenous DE’s | Ex. 31-9 |
| 3.9 | Applications of second order DEs | Ex. 31-10 |
| 3.10 | Laplace transforms | Ex. 31-11 |
| 3.11 | Solving DE’s by Laplace transforms | Ex. 31-12 |
| 3.12 | Review exercise |  |

**IV. REQUIRED RESOURCES / TEXTS / MATERIALS:**

1. Basic Technical Calculus with Analytic Geometry, A. J. Washington, 9th Edition, Pearson Canada.
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:

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|  | 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 |
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|  | 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. |  |

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| **Course: MTH 654** | |  | |
| **Evaluation Device** | **Topics Covered**  (reference topic numbers from the course outline) | | **% weight of Final Average** |
| Test 1 | 1.1-1.4, 1.6 | | 25% |
| Test 2 | 1.5, 1.7, 1.8, 2 | | 25% |
| Test 3 | 3.1 – 3.5 | | 25% |
| Test 4 | 3.6 – 3.12 | | 25% |

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| **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.  Electronic Devices:  Personal use of electronic devices such as cell phones, iPods, MP3 players, tablets, laptop computers etc. during class is prohibited. |
| **VII. COURSE OUTLINE ADDENDUM:**   |  |  | | --- | --- | | 1. | 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. | | 2. | 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. | | 3. | 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. | | 4. | Accessibility 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 Accessibility Services office. Visit Room E1101  or call Extension 2703 so that support services can be arranged for  you. | | 5. | Communication:  The College considers ***Desire2Learn (D2L)***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 this Learning Management System (LMS)  communication tool.  The professor reserves the right to use other tools and/or techniques that may be more applicable. These other tools/techniques for effective communication will be discussed, identified and presented throughout the delivery of course content. | |
| |  |  | | --- | --- | | 6. | Academic Dishonesty:  Students should refer to the definition of “academic dishonesty” in  *Student Code of Conduct*. Students who engage in academic  dishonesty will receive an automatic failure for that submission and/  or such other penalty, up to and including expulsion from the  course/program, as may be decided by the professor/dean. 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. | | 7. | Tuition Default:  Students who have defaulted on the payment of tuition (tuition has  not been paid in full, payments were not deferred or payment  plan not honoured) as of the first week of November (fall semester  courses), first week of March (winter semester courses) or first week  of June (summer semester courses) will be removed from placement  and clinical activities due to liability issues. This may result in loss of  mandatory hours or incomplete course work.  Sault College will  not be responsible for incomplete hours or outcomes that are not  achieved or any other academic requirement not met as of the  result of tuition default. Students are encouraged to communicate  with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic  progress. | | 8. | 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, in addition to announcements, news,  academic calendar of events, class cancellations, your learning  management system (LMS), and much more. Go to  <https://my.saultcollege.ca>. | |  |
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