

**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 |

|  |  |  |
| --- | --- | --- |
| **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:

|  |  |  |  |
| --- | --- | --- | --- |
|  | 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 | 1.1-1.4, 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% |

|  |
| --- |
| **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. |
|  |
|  |
|  |
|  |
|  |