



Republic of the Philippines  
**SULTAN KUDARAT STATE UNIVERSITY**  
Isulan, Sultan Kudarat  
College of Industrial Technology  
S.Y. 2024-2025



***MST 007***  
**INTEGRAL CALCULUS**  
**Syllabus**

2<sup>nd</sup> Semester  
A.Y 2024 – 2025





Republic of the Philippines  
**SULTAN KUDARAT STATE UNIVERSITY**  
Isulan, Sultan Kudarat  
**College of Industrial Technology**  
**S.Y. 2024-2025**



### UNIVERSITY VISION

A trailblazer in arts, science and technology in the region.

### UNIVERSITY MISSION

The University shall primarily provide advanced instruction and professional training in science and technology, agriculture, fisheries, education and other relevant fields of study.

It shall also undertake research and extension services, and provide progressive leadership in its areas of specialization.

### UNIVERSITY GOAL

To produce graduates with excellence and dignity in arts, science and technology.

### UNIVERSITY OBJECTIVES

- Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services;
- Provide relevant programs and professional trainings that will respond to the development needs of the region;
- Strengthen local and international collaborations and partnerships for borderless programs;
- Develop a research culture among faculty and students;
- Develop and promote environmentally-sound and market-driven knowledge and technologies at par with international standards;
- Promote research-based information and technologies for sustainable development;
- Enhance resource generation and mobilization to sustain financial viability of the university.

### Program objectives and its relationship to University Objectives:

#### PROGRAM OBJECTIVES (PO)

A graduate of Bachelor of Science in Industrial Technology can:

- assume professional, technical, managerial and leadership roles in industrial organizations with the desired competence in the fields of practiced such as Automotive, Architectural Drafting, Civil, Electrical, electronics, food and its allied discipline.
- innovate explicit and modern technologies in the advancement of economy, society, technology and environmental sustainability.
- generate research-based information and technologies at par from international standards; and
- promote and transfer knowledge and technologies for effective and efficient school-industry partnership.

	a	b	c	d	e	f	g
✓	✓						
✓	✓	✓	✓		✓	✓	✓
✓	✓	✓	✓	✓	✓	✓	
✓		✓	✓		✓	✓	✓



1. Course Code : MST 007
2. Course Title : Integral Calculus
3. Pre-requisite : None
4. Credit : 3 units

### 5. Course Description:

This course covers differentiation and integration of exponential, logarithm and trigonometric functions; the concepts of the definite and indefinite integral and some applications of the definite integral.

### 6. Course Learning Outcomes and Relationships to program Educational Objectives

Course Learning Outcome	Program Objectives			
At the end of the semester, the students can:	a	b	c	d
a) Apply differentiation of transcendental functions,	✓	✓	✓	✓
b) apply definite and indefinite integration in solving various conceptual and real-world problems.	✓	✓	✓	✓

### 7. Course Content

Course Objectives, Topics, Time Allotment	Desired Student Learning Objectives	Outcome-Based Assessment (OBA) Activities	Evidence of Outcomes	Course Outcomes	Program Objectives	Values Integration
Topic: VMGO, Classroom Policies, Course Overview, Course Requirements, Grading System (1.5 hour)						
Explain VMGO of the SKSU, classroom policies, scope of the course, course requirements and grading system.	Student can be aware of the SKSU VMGO, classroom policies, scope of the course, course requirements and grading system.	<ul style="list-style-type: none"> <li>Class Discussion</li> <li>Student's Feed backing</li> </ul>	<ul style="list-style-type: none"> <li>Individual Recitation</li> </ul>	a,b	a, b, c, d	Value of Responsibility
Chapter 1: The Definite Integral and Integration (12 hours)						
1. The Differential 2. Anti – differentiation 3. Some Techniques of Anti – Differentiation 4. Differential Equations and Rectilinear Motion 5. The Definite Integral	<ul style="list-style-type: none"> <li>Discuss approximations using differentials.</li> <li>Define Anti – derivative.</li> <li>Establish basic anti – derivative formulas</li> <li>Apply the notion of anti – derivative to rectilinear</li> </ul>	1. Class Discussion 2. Video-watching • The Differential Anti – differentiation Some Techniques of Anti – Differentiation	<ul style="list-style-type: none"> <li>Exercises (Worktext)</li> <li>Selected Problems in the IM</li> <li>Recommended Video:</li> </ul>	a, b	a, b	Value of Attentiveness



6. The Fundamental Theorem of the Calculus	<ul style="list-style-type: none"> <li>motion problems and separable differential equations.</li> <li>Set up the geometric interpretation of the definite integral.</li> <li>Relate the concept between derivative and definite integral.</li> </ul>	<ul style="list-style-type: none"> <li>Differential Equations and Rectilinear Motion(<u>Stopping distance is 80 m for Car at 100 km per h Find deceleration</u> Antiderivatives application)</li> </ul>	<ul style="list-style-type: none"> <li>Review: Quiz</li> </ul>			
<b>Chapter 2: Applications of the Definite Integrals (7.5 hours)</b>						
<ol style="list-style-type: none"> <li>Area of a Plane Region</li> <li>Volumes of Solids by Slicing, Disks and Washers</li> <li>Volumes of Solids by Cylindrical Shells</li> </ol>	<ul style="list-style-type: none"> <li>Present graphical interpretation of the applications of definite integrals, (Area and Volumes)</li> </ul>	Pre-discussions exercises, instruction add-ons and practice exercises may be taken from the online resources.	<ul style="list-style-type: none"> <li>Problem Sets</li> <li>Quiz</li> </ul>	a, b	a, b, d	Value of Responsibility
<b>Chapter 3: Derivatives of Elementary Transcendental Functions (9 hours)</b>						
<ol style="list-style-type: none"> <li>The Inverse of a Functions (review)</li> <li>Logarithmic Functions and their Derivatives</li> <li>Logarithmic Differentiation</li> <li>Exponential Functions and their Derivatives</li> </ol>	<ul style="list-style-type: none"> <li>Discuss various transcendental functions and their derivatives</li> </ul>	Pre-discussions exercises, instruction add-ons and practice exercises may be taken from the online resources.	<ul style="list-style-type: none"> <li>Problem Sets</li> <li>Quiz</li> </ul>	a, b	a, b, d	Value of Self - Reliance
<b>Chapter 4: Integrals of Transcendental Functions (12 hours)</b>						
<ol style="list-style-type: none"> <li>Integral Yielding the Natural Logarithmic Function</li> <li>Integral of Exponential Functions</li> <li>Integral of Trigonometric Functions</li> <li>Applications of Natural and Exponential Function</li> </ol>	<ul style="list-style-type: none"> <li>Discuss integrals of transcendental functions and its applications to processes of growth and decay.</li> </ul>	Pre-discussions exercises, instruction add-ons and practice exercises may be taken from the online resources.	<ul style="list-style-type: none"> <li>Problem Sets</li> <li>Quiz</li> </ul>	a, b	a, b, d	Value of Understanding



**Chapter 5: Techniques of Integration (9 hours)**

1. Integration of Parts 2. Trigonometric Integrals (Powers of Sine, Cosine, Tangent, Cotangent, Secant, and Cosecant) 3. Integration of Rational Functions by Partial Fractions	<ul style="list-style-type: none"> <li>Discuss the need for special techniques of integration.</li> </ul>	Pre-discussions exercises, instruction add-ons and practice exercises may be taken from the online resources.	<ul style="list-style-type: none"> <li>Problem Sets</li> <li>Quiz</li> </ul>	a, b	a, b, c, d	Value of Responsibility
---	---	--	--	------	------------	----------------------------

**TOTAL: 54 hours**

Lectures: 51 hours

Examination (Midterm and Final): 3 hours

**8. Course Evaluation****Course Requirements:**

- Attendance
- Major Exams (Midterm and Final)
- Recorded Problem Sets, Quizzes and all other outputs

**Grading System:****MIDTERM**

1. Quizzes	- 25 %
2. Learning Output, Seatworks, Assignments	- 15 %
3. Midterm Exam	- 50 %
4. Attendance	- <u>10 %</u>
<b>Total</b>	- <b>100%</b>

**FINAL TERM**

1. Quizzes	- 25 %
5. Learning Output, Seatworks, Assignments	- 15 %
2. Final Exam	- 50 %
3. Attendance	- <u>10 %</u>
<b>Total</b>	- <b>100%</b>

$$(\text{Midterm Grade} + \text{Final Term Grade})/2 = \text{Final Grade}$$
**Schedule of Examination**

Midterm	- March 19 – 21, 2025
Final Term	- May 21 – 23, 2025

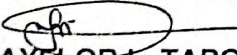
## 7. References:

- Egarguin, Neil Jerome A., et. Al., (2017) Basic Calculus for Senior High School: C&E Publishing Inc.  
Edwards, C.H. and Penney, D.E. (2008) *Calculus: Early Transcendentals* (7<sup>th</sup> ed.) Upper Saddle River, NJ: Pearson/Prentice Hall  
Larson, R.E. Hosteller, R & Edwards, B.H. (2008) *Essential Calculus: Early Transcendental Functions*. Boston: Houghton Mifflin  
Tan, Soo T. (2012) *Applied Calculus for the Managerial, Life and Social Sciences: A Brief Approach*, Australia: Brooks/Cole Cengage Learning  
Vargerd, D.E., Purcell, E.J. & Rigdon, S.E. (2007) *Calculus* (9<sup>th</sup> ed.) Upper Saddle River, N.J.: Pearson Education International

## Online Sources:

- Retrieved from [the definite integral and integration - Search](#)  
Retrieved from [Why It Matters: Applications of Integration | Calculus I](#)  
Retrieved from [Derivatives of Elementary Transcendental Functions - Search](#)  
Retrieved from [6\\_7\\_Integ\\_w:Transc\\_Mar\\_20\\_08.dvi](#)  
Retrieved from [7: Techniques of Integration - Mathematics LibreTexts](#)

Prepared by:

  
**MAYFLOR L. TAPOT, MST**  
Subject Teacher

Reviewed by:

**GLENN S. TALUA**  
BSIT Program Head

Approved by:

**CHARLIE J. MAGHANOY, EdD**  
Dean