MATH 106

Integral Calculus

Instructor: **Ibraheem Alolyan**

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Office Hours: Mon: 7 – 8, 12:30 – 2 ,,,, Wed 7 - 9, 10-11, 12 – 1
(If these times are not convenient, please feel free to contact me by email, and we can arrange an alternative meeting time.

Text Book:

Calculus by Swokowski, Olinick, Pence (Sixth Edition)

Course Topics:

1- Integrals
2- Transcendental functions
3- Techniques of integration
4- Applications of the definite integral.
5- Parametric equations and polar coordinates

Grading:

First midterm **25** (Mon 13 / 10 / 2025) (7:30 – 9:00 pm)
Second midterm **25** (Mon 17 / 11 / 2025) (7:30 – 9:00 pm)
Quizzes **10**
Final **40** (Wed 24 / 12 / 2025) (1:00 – 4:00 pm)

Contents

Book: Calculus by Swokowski, Olinick, Pence (Sixth Edition)

Sections Topic

Exercises

4.1. Anti-derivatives and indefinite integrals:
1,5,7,11,14,15,17,23,27,29,35,41,43,49

4.2. Change of variables in indefinite integrals:
1,3,5,7,9,16,20,21,27,32,37

4.3. Summation notation and area:
1,2,3,5,6,9,12,27,37

4.4. The definite integral:
1,5,10,11,15,16,19,20,31,33,37

4.5. Properties of definite integral:
7,10,11,15,17,22,23,25,29,34

4.6. The fundamental theorem of calculus
1,7,8,9,11,12,13,15,17,21,29,32,36,45,47

4.7. Numerical integration:
15,16,17,18,33,34

6.2 The natural logarithm function:
3, 5,9,11,32,35,39,41,42

6.3. The exponential function:
1,3,6,11,15,31,33

6.4. Integration using natural logarithm and exponential function:
1,3,6,11,15,18,19,30,3

6.5. General exponential function and logarithm function:

1,5,15,17,23,29,37,39,41,4

6.7. Inverse trigonometric functions:

31,33,37,43,51,52,56,57,60,61,62

6.8. Hyperbolic and inverse hyperbolic functions:

19,20,21,28,29,61,63,65,67,73,74,75,79,80

6.9. Indeterminate forms and L'Hopital's rule:

49,51,57,58,59,64,65,74,76

7.1. Integration by parts:

1,2,7,11,12,13,16,17,31

7.2. Trigonometric integrals:

1,3,4,5,7,9,11,13,15

7.3. Trigonometric substitutions:

1,3,5,7,9,10,21,22

7.4. Integrals of rational functions (Partial fractions):

1.2.5,6,9,11,25

7.5. Quadratic expressions and miscellaneous substitutions:

1,3,5,6,10,12,25,26,27,28,32,47,48,49,50

7.7. Improper integrals:

1,2,4,7,13,14,15,17

5.1. Area between curves:

5,6,9,10,11,12,14,27,28,31

5.2. Volume (by disk or washer method):

5,6,8,9,21,25

5.3.Volume (by Cylindrical shells method):

5,6,7,11,13,15,17,19,21

5.5. Arc length and surface of revolution:

5,7,11,12,13,29,30,32,35,36,42

9.1. Parametric equations:

1,3,5,7,25

9.2. Arc length and surface area:

1,5,7,9,21,29,31,33,35,37

9.3. Polar coordinates:

1,2,3,5,7,9,27,31,33,37,38,51,53,59

9.4. Integrals in polar coordinates:

1,3,18,19,22,23,27,30,35,37

Midterms: dates to be determined.