# Math1411-Calculus I

**Course Outline**                    **First Semester 2022-2023**

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**Textbook: Thomas' Calculus, Twelfth Edition, G. Thomas, M. Weir and J. Hass.**

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**Course Description:** Review functions, limits, continuity, differentiation and integration. Applications of integrals: volumes, length of curves, area of surface of revolution, Transcendental functions: logarithmic functions, exponential functions, hyperbolic functions, inverse functions, techniques of integration: integration  by parts, partial fractions, integration of trigonometric functions, trigonometric substitution, improper integrals, complex numbers.

**Grading Policy:**

Midterm Exam: 35%

Three Short Exams: 20%

Final Exam: 45%

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Remarks:

1.  This course will be taught in Lecture-Discussion form. Attendance is a must. You should, at least, try to solve the problems given below before coming to the discussion. You should try to solve as many problems as you can to understand and improve your comprehension of the material.

2. There will be no make-up exams for the midterm exam. In case of absence you should justify it to your instructor.
3. Check your Ritaj account regularly for any announcements.
4. Turn your mobile phones off or put it in silent mode.
5. If you have any questions, you can see your instructor during his office hours.
6. Calculators are not allowed during the exams.

**Course Material**

| Section | Title |
|---|---|
| **Chapter Six: Applications of Definite Integrals** | |
| 6.1 | Volumes using cross sections |
| 6.2 | Volumes using cylindrical shells |
| 6.3 | Arc length |
| 6.4 | Areas of surface of revolution |
| **Chapter Seven: Transcendental Functions** | |
| 7.1 | Inverse functions and their derivatives |
| 7.2 | Natural logarithms |
| 7.3 | Exponential functions |
| 7.4 | Exponential change |
| 7.5 | Indeterminate forms and L'Hopital's rule |
| 7.6 | Inverse Trigonometric functions |
| 7.7 | Hyperbolic functions |
| 7.8 | Relative Rates of Growth |
| **Chapter Eight: Techniques of Integration** | |
| 8.1 | Integration by parts |
| 8.2 | Trigonometric integrals |
| 8.3 | Trigonometric substitutions |
| 8.4 | Integration of rational functions by partial fractions |
| 8.7 | Improper integrals |
| **Appendix7** | Complex Variables |

## Homework Problems

| Section Number | Class Problems | Homework Problems |
|---|---|---|
| **Chapter 6** | | |
| 6.1 | 10,24,32,44 | 2,5,9,18,22,25,27,37,45,51 |
| 6.2 | 9,17,29 | 6,10,13,18,20,24,28,36,38 |
| 6.3 | 4,19 | 2,6,7,10,22 |
| 6.4 | 18,20 | 15,17,22 |
| **Chapter 7** | | |
| 7.1 | 12,31,41 | 11,22,32,33,42,44 |
| 7.2 | 23,46,64 | 2,4,21,24,34,54,65,68,71 |
| 7.3 | 26,42,57,92 | 18,21,28,44,50,52,58,63,75,91,98,106,110,116 |
| 7.4 | 30 | 28,31,36 |
| 7.5 | 16,56,68 | 10,21,27,30,34,38,42,47,53,60,66,72 |
| 7.6 | 12,33,63,75 | 3(a),5(b),10,18,22,34,38,44,52,59,68,74,84,90 |
| 7.7 | 15,54 | 4,6,10,18,21,42,52,60 |
| 7.8 | | 2,5 |
| **Chapter 8** | | |
| 8.1 | 11,25 | 6,12,16,22,30,33,39,49 |
| 8.2 | 33,45,67 | 6,11,17,22,28,34,41,52,64 |
| 8.3 | 20,26 | 12,18,24,30,33,38,46,54 |
| 8.4 | 17,30 | 12,15,20,23,28,37,39,47,53 |
| 8.7 | 15,47,63 | 4,10,14,16,25,32,37,41,50,58,62,65 |
| **Appendix 7** | 9,12,24 | 2,8,10,13,19,20,21 |
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