MAT 112

جامعة الفيصل
Alfaisal University
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Alfaisal University

Spring 23 - 24

Calculus II

Class Time: Sunday to Thursday: 9 – 12.
Prerequisite: Calc 1 MAT101
Office: SG 38
Email: statar@alfaisal.edu, salihtat@gmail.com
Office Hours: Sunday to Thursday: 1-2

Class Location: B1.004-58, S1. 33-25-46
Instructor: Dr. Salih Tatar
Phone: +966-1-215-7644

Text Books:
Stewart, J., 2016, *Calculus Early Transcendentals*, 8th Ed. ISBN: 978-1-285-74155-0

Course Description:
This course is a continuation to Calculus I. The course covers basic mathematical analysis and tools, widely used in more sophisticated mathematics-based tools in various areas. The topics include Integration techniques, applications of integration like volumes by disk and cylindrical shells methods, Arc length and area of a surface of revolution, parametric equations and polar coordinates, conic sections, infinite sequences and series.

Course Objectives:
Upon completion of this course, students will be able to:

- Evaluate integrals using different techniques (by parts, trigonometric rules, substitution, partial fraction decomposition…etc)
- Find Volumes using cylindrical shells
- Find arc length
- Find the Area of a Surface of Revolution
- Analyze, write equations and sketch a parabola, ellipse and hyperbola
- Analyze a set of parametric equations
- Sketch a graph in polar form
- Analyze and write a polar equation of a conic
- Determine whether sequence and series converge or diverge and find radius and center of convergence
- Represent functions by power series
- Find Taylor and Maclaurin Series of a function

Grading Scheme:

2 Quizzes	20 %
2 Midterm Exams	40 %
Hws	10%
Final Exam: Comprehensive	30 %
TOTAL	100 %

A	95-100 %	**A-**	90-94 %
B+	86-89 %	**B**	83-85 %
B-	80-82 %	**C+**	76-79 %
C	73-75 %	**C-**	70-72 %
D+	66-69 %	**D**	60-65 %
F	< 60 %		

All quizzes and exams will be closed book and closed notes. A successful student will prepare by reading the text book, attending lectures, participating in class discussions and questions, and by doing homework and practice problems.

Attendance Policy

- **Policy related to missing classes:** Regardless of the reasons, a student missing 15% or more of classes will be denied (DN) from the course. The 15% absences are intended to accommodate for medical emergencies[1] and cases of bereavement of an immediate family member[2]. Only in these cases will the student be allowed to make up missed class work or missed exams
- **Arriving late to class:** Coming to class 5 minutes after the start of class time is considered late, and 3 lates will count as 1 absence. Coming to class 10 minutes late will be considered as an absence.

[1]*Medical emergency counts for only verifiable communicable diseases and unforeseen, beyond the student's control, hospitalization. It needs to be documented by the hospital (not a clinic, much less a private practice doctor) and will be verified.*
[2]*Bereavement document from the Ministry of Health will be required in case, God forbid, of a death in your immediate family. In such a case, you will be excused for three days.*

Cell Phone/ Laptop/ IPad Policy

All electronic devices are not allowed during the exams (except calculators under the instructor permission). Most notably **cell phones are not allowed even in off mode. An irrevocable score zero (0) will be assigned to any student caught with a cell phone and may be subject to further disciplinary measures.** Students are not allowed to use their mobile phones, IPads or laptops during regular classes. Any student caught using any of these devices will be instructed to leave the classroom and will be given a full absence for that particular lecture.

Academic Integrity

Students are expected to maintain academic integrity at all times and to seek assistance from the instructor when uncertain. Students who engage in activities which misrepresent their academic work through plagiarism, cheating, and falsification infractions of academic integrity will be subject to serious disciplinary measures, ranging from a zero grade in that assessment to the dismissal from the university altogether. All aspects of the course are covered by these rules, including homework, lab reports, course reports, quizzes, and exams.

Consequences of Misconduct

When discipline and misconduct issues become apparent, a student will initially receive a verbal warning as a reminder to respect the professor's authority during class time. If this misconduct during class time occurs few more times, the student will be terminally dismissed from the particular course or from the university altogether. Any student disrupting an examination may be instantly dismissed from the examination room and risk taking an F grade.

Assignments, Quizzes and Exams

Late assignments will not be accepted; they must be completed on the day they are due to receive credit. There is no provision to make-up for missed homework assignments, quizzes, midterm or final exams except under reasons deemed acceptable by your professor (*refer to attendance policy section*).

The professor is expected to **return promptly** the grades of homework assignments, lab reports, quizzes, and midterm exams and to go over them with proper feedback and solutions. Grades will be posted within a maximum of one week after the day on which the assessment was offered.

Students must always present their Alfaisal ID cards during exam times.

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<u>**Lines of Communication**</u>

If you have any concern or suggestion, it is imperative to follow the following steps in the order they are listed:

1. First, talk to your professor to resolve your issue.

2. Second, if your issue has merit and was not resolved by your professor in a reasonable time frame, you may then contact the Chair of the Department.

3. Third, if your issue has merit to be escalated further along the hierarchy, you may then contact the Vice Dean for Academic & Student Affairs. The Vice Dean will address your issue on time.

4. Failure to give due chance and time to resolving your issue with your professor, your Department Head, and your Vice Dean, and going above their heads straight to the Dean or to the Provost, will certainly invite disciplinary measures for not adhering to the institutional lines of communication outlined above.

Notes:

1. If your issue has no merit, learn to take **NO** for an answer; do not expect a miracle from the Department Chair nor from the Vice Dean.

2. Students are discouraged from nagging their professors to extract undeserved higher grades. Students who engage in this behavior will be automatically barred from consideration when their professors study borderline cases for possible slight grade improvement at the end of the semester.

Date	Chapters	Suggested Problems
Week 1 14 – 20 Jan.	Syllabus Review of Basic integration Rules: Inverse trigonometric functions	**5.5:** 1- 35
Week 2 21 – 27 Jan.	**6.1** Areas Between Curves **6.2** Volumes by Method of Disk/Washer	**6.1:** 1 – 4, 5, 8, 13, 14, 17, 18, 20, 27, 56 **6.2:** 1 – 10, 12
Week 3 28 Jan – 3 Feb. **28 January Long Weekend**	**6.3** Volumes by Cylindrical Shells Comparison of Method of Disk/Washer and Shells	**6.3:** 3 – 7, 15, 19
Week 4 4 – 10 Feb.	**7.1** Integration by Parts **7.2** Trigonometric Integrals	**7.1:** 1-36 **7.2:** 1–8, 12–18, 21–31, 34
Week 5 11 – 17 Feb.	**7.3** Trigonometric Substitution **Quiz 1(11 Feb)**	**7.3:** 1 – 30 **7.4:** 1-6, 9, 12, 15, 19, 20, 21, 23, 35, 39, 47
Week 6 18 – 24 Feb. **22 February – Founding Day**	**7.4** Integration of Rational Functions by Partial Fractions	**7.8:** 5- 9, 13, 21, 28 – 40 **8.1:** 9 - 22
Week 7 25 Feb - 2 March **Semester Break**	-----------------------	**8.2:** 7 - 18
Week 8 3 - 9 March.	**Midterm1 (3 March)** **7.8** Improper Integrals **8.1** Arc Length	**10.1:** 5 – 10
Week 9 10 – 16 March	**8.2** Area of a Surface of Revolution **10.1** Curves Defined by Parametric Equations	**10.2:** 1 – 20, 29, 31, 33, 37, 41, 43, 61, 62, 65
Week 10 17 – 23 March	**10.2** Calculus with Parametric Curves **10.3** Polar Coordinates	**10.3:** 1 – 6, 55 – 62 **10.4:** 1 – 10, 17, 18, 19, 23, 24, 26
Week 11 24 – 30 March	**Quiz2 (26 March)** **10.4** Areas and Lengths in Polar Coordinates **11.1** Sequence	**11.1:** 5, 7, 9, 10, 11, 15, 17, 19, 21, 24, 29, 36, 39, 45, 61, 62, 65 **11.2:** 17, 18, 19, 21, 22, 26, 27, 29, 31, 32, 34, 36, 37, 38, 41, 42, 44 **11.3:** 3 – 26 **11.4:** 3,4, 6,7,9,11,14,17,18,20, 25, 29
Week 12 31 March - 6 April.	**Eid Break**	**11.5:** 2 – 20, 33, 34

Week 13 7 - 13 April.	**Eid Break**	
Week 14 14 - 20 April.	**11.2** Series **11.3** The Integral Test]**11.4** The Comparison Tests --	**11.6:** 2 – 20, 25 – 33 **11.7:** 1 - 38
Week 15 21- 27 April.	**11.5** Alternating Series 1**1.6** Absolute Convergence and the Ratio and Root Tests **11.7** Strategy for Testing Series	**11.8:** 1, 2,3,4,5,6,7,11,12, 15,16, 17, 18, 23, 30.
Week 16 28 April - 4 May **2 May Long Weekend**	**Midterm2 (30 April)** **11.8** Power Series	**11.8:** 1, 2,3,4,5,6,7,11,12, 15,16, 17, 18, 23, 30.
5 May – 11 May	**11.9** Representation of functions as Power Series	**11.8:** 3, 4, 5, 6, 7, 8, 9, 10, 11, 12
12 May – 18 May	**11.9** Representation of functions as Power Series and Review	
19 May – 30 May	**Final Exam Period**	