**Calculus II**

**Instructor:** Dr. Jesse Crawford Office phone: (254) 968-9536

Email: [jcrawford@tarleton.edu](mailto:jcrawford@tarleton.edu) Office: Math 332

Website: faculty.tarleton.edu/crawford

**Office Hours:**

M—R 3:00 – 4:00

**Course Meeting Times:** MWF 1:00 – 1:50 and TR 1:40 – 2:55.

**Required Materials:** We will cover chapters 6–11 in *Calculus: Early Transcendentals*, 7th ed., by Stewart. You will also need a graphing calculator, such as a TI-83 Plus or a TI-nspire CAS.

**Exams:** There will be four exams during the semester and a cumulative final exam.

**Homework:** Homework will be assigned almost every day, and it will usually be due two class periods later. It is crucial to keep up with the homework to succeed in this course.

**Grades:** The following tables show how your final grade will be calculated.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Percentage**  **of Grade** |  | **Average** | **Grade** |
| Homework | 20% | 90-100 | A |
| Exam 1 | 15% | 80-89 | B |
| Exam 2 | 15% | 70-79 | C |
| Exam 3 | 15% | 60-69 | D |
| Exam 4 | 15% | 0-59 | F |
| Final Exam | 20% |  |  |

**Missed Exams and Late Homework:** A student who misses an exam for a valid reason, such as **serious** illness or the death of a family member will be allowed to make up the exam. Students who make up exams are required to provide documentation confirming that the absence occurred for a legitimate reason. You may submit up to three late homework assignments during the semester, and a few homework assignments will be dropped.

**Students with Disabilities:** It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (<http://www.ada.gov/>) and other applicable laws. If you are a student with a disability seeking accommodations for this course, please contact Trina Geye, Director of Student Disability Services, at 254.968.9400 or [geye@tarleton.edu](mailto:geye@tarleton.edu). Student Disability Services is located in Math 201. More information can be found at [www.tarleton.edu/sds](http://www.tarleton.edu/sds) or in the University Catalog.

**Academic Integrity:** The Tarleton University Mathematics Department takes academic integrity very seriously. The usual penalty for a student caught cheating includes an F in the course. Further penalties may be imposed, including expulsion from the university.

**Service Week:** In support of Tarleton’s core value of service, each student is expected to participate in a service learning experience as a part of the spring term week of service.  Service day is **Thursday, March 22**. This experience will challenge students to be engaged in the local community, address a community need, connect course objectives to the world around you, and involve structured student reflection. In this service learning experience you will not only enhance your knowledge and skills, but actively use those skills as you serve your community.

**How to Succeed in This Course:**

1. Attend Class. Only miss class when absolutely necessary.
2. Pay attention during class.
3. Start homework as soon as possible. Don’t procrastinate.
4. Get help on problems that you are struggling with, either from me, the math clinic, or other students.
5. Study a moderate amount before exams.

**Student Learning Outcomes:**

Knowledge Outcomes:

1. Investigate the concepts of single variable calculus descriptively, numerically, graphically and symbolically.

Skill Outcomes:

1. Evaluate an integral using appropriate techniques.
2. Apply the integral in solving problems including volumes, areas, arc lengths, work, surface area of a solid of revolution.
3. Determine the convergence of sequences and series.
4. Construct the power series representation of a function.
5. Apply the derivative and integrals to polar and parametric equations.
6. Communicate mathematical ideas, solutions, proofs, and counterexamples using proper notation, appropriate technical and non-technical language, and helpful diagrams and graphs.

**Sections of Primary Interest:**

* Chapter 6: Applications of Integration
  + Areas Between Curves
  + Volumes
  + Volumes by Cylindrical Shells
  + Work
  + Average Value of a Function
* Chapter 7: Techniques of Integration
  + Integration by Parts
  + Trigonometric Integrals
  + Trigonometric Substitution
  + Integration of Rational Functions by Partial Fractions
  + Integration Using Tables and Computer Algebra Systems
  + Approximate Integration
  + Improper Integrals
* Chapter 8: Further Applications of Integration
  + Arc Length
  + Area of a Surface of Revolution
  + Applications to Physics and Engineering
  + Applications to Economics and Biology
  + Probability
* Chapter 9: Differential Equations
  + Modeling with Differential Equations
  + Direction Fields and Euler’s Method
  + Separable Equations
  + Models for Population Growth
  + Linear Equations
  + Predator-Prey Systems
* Chapter 10: Parametric Equations and Polar Coordinates
  + Curves Defined by Parametric Equations
  + Calculus with Parametric Curves
  + Polar Coordinates
  + Areas and Lengths in Polar Coordinates
  + Conic Sections
  + Conic Sections in Polar Coordinates
* Chapter 11: Infinite Sequences and Series
  + Sequences
  + Series
  + The integral Test and Estimates of Sums
  + The Comparison Tests
  + Alternating Series
  + Absolute Convergence and the Ratio and Root Tests
  + Strategy for Testing Series
  + Power Series
  + Representations of Functions as Power Series
  + Taylor and Maclaurin Series
  + Applications of Taylor Polynomials