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Office: Math 306  
Office Hours: MWF 10–10:50, MTWR 2:30–3:20  
Department: Mathematics and Statistics  
Class meeting time/place: Class—TR 11–12:15 in Math 214; Lab W 1–2:15 in Math 359  

Credit hours: MTH 234–3; MTH 234L–1  
The following is an excerpt from SFA Policy 5.4:  

The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;  
2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Course Description: Applications and techniques of integration, improper integrals, infinite series, and power series.


Program Learning Outcomes (PLO): Students graduating from SFASU with a B.S. Degree and a major in mathematics will demonstrate:

1. Lower Order Cognition. Examples: remembering definitions, understanding how to factor, applying the chain rule.

3. Proficiency in communicating mathematics in a format appropriate to expected audiences (written, visual, oral).

**Student Learning Outcomes (SLO):** At the end of MTH 234, a student who has studied and learned the material should be able to:

1. Extend the definition of the definite integrals to applications, other than area under a curve, including volumes of surfaces of revolution, arc length, and surface area, as well as to examples from other academic fields which might include work, fluid forces, or moments and centers of mass. [PLO: 1, 2, 3]

2. Demonstrate mastery of basic integration techniques. [PLO: 1, 3]

3. Solve more complicated integrals by applying techniques including integration by parts, partial fractions, and trigonometric substitutions. [PLO: 1, 2, 3]

4. Recognize that the Fundamental Theorem of Calculus does not allow for the computation of all definite integrals and be able to apply approximation techniques as an alternative. [PLO: 1, 2, 3]

5. Recognize an improper integral and apply limits to find a solution. [PLO: 1, 3]

6. Define infinite sequences and series and determine convergence and divergence behavior by appropriately applying strategies such as the integral test, comparison tests, and ratio and root tests. [PLO: 1, 2, 3]

7. Recognize alternating series and determine absolute and conditional convergence behavior. [PLO: 1, 2, 3]

8. Determine the radius and interval of convergence of a power series. [PLO: 1, 2, 3]

9. Develop Taylor/Maclaurin Series expansions for basic functions. [PLO: 1, 2, 3]

**Course Requirements:** Homework will be regularly assigned, but not collected; students are responsible for completing the homework and understanding the material. Students will be expected to come to class prepared—most notably, to have read the section(s) under discussion and attempted any assigned homework. Assessments will likely consist of in-class quizzes and exams, though other types of assessments (take-home assignments, etc.) may be added at the instructor’s discretion. Quizzes will occur approximately every other day; exams about every sixth day. The final exam will be comprehensive and is scheduled for Th, 12 Dec, 10:45–1:15.

**Course calendar/outline:** (Topics may be presented in a different order than given here)

- Applications of the Definite Integral
  - Volumes of surfaces of revolution
  - Arc length
  - Surface area

  Approximate time spent 30%
- One or more from the following applications:
  - Work
  - Fluid pressure and forces
  - Moments and centers of mass

- **Techniques of Integration** 30%
  - Basic integration techniques
  - Integration by parts
  - Integration by partial fractions
  - Trigonometric substitutions
  - Numerical integration
  - Improper integrals

- **Infinite Sequences and Series** 40%
  - Sequences
  - Infinite series
    - Geometric series
    - Harmonic series
    - General series
  - Integral test
  - Comparison tests
    - Direct comparison test
    - Limit comparison test
  - Ratio and root tests
  - Alternating series
    - Absolute convergence
    - Conditional convergence
  - Power series
  - Taylor and Maclaurin series

**Grading Policy:** Grades will be based on the total points accumulated on assessments. If you miss a regularly scheduled quiz/exam, the next grade of the same type will count double. *There will be no extra credit (other than, perhaps, bonus questions on exams).*

**Attendance Policy:** Attendance is expected and roll will be checked every day. Students who miss no more than two class days may receive special consideration in determining their grade.

**Academic Integrity (A-9.1):** Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism.

**Definition of Academic Dishonesty**
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they
were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit.

Read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp

**Withheld Grades (Semester Grades Policy A-54):** Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities:** To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations.

For additional information, go to http://www.sfasu.edu/disabilityservices/

**Acceptable Student Behavior:** Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

Please be respectful of your fellow students and your instructor. Cell phone use and texting are not allowed in class. Remember to turn your cell phone off or place it in quiet mode before entering the classroom.