MAT 168H Calculus II

Bulletin Description Prerequisite: MAT 167. Definite and indefinite integrals, integration techniques, application of integrals, improper integrals and LHopitals rule (CC 1623).

Text *Calculus,* James Stewart, Brooks/Cole Publishing, (2007).

References The following is a partial list of supplemental reading:

1. *Calculus and Analytic Geometry*, G.B. Thomas, Jr., Addison Wesley.

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Goals To provide an introduction to the basic structure of integral calculus, developing an understanding of the properties of integration based on geometrical and analytical methods. The intent is to introduce theory and practice supported by a problem solving approach with foundations in the basics of analysis.

1. Understanding integrals through summation (sigma notation) and developing concepts in integration theory. The Fundamental Theorem of Calculus.
2. Applications of integration to finding the area between regular curves and finding the volumes of rotation. The introduction of work (as an integral) and the average value of a function.
3. Techniques of integration, including: Integration by Parts (vital), trigonometric substitution, partial fractions, and rationalized substitutions. Methods for obtaining approximate integrals (numerical techniques) and the evaluation of improper integrals.
4. Infinite sequences and series.

Theory and proof are stressed throughout, however the course also requires that the student develop proficiency in working with theorems for problem solving.

Topics The intent is to cover chapters 5–8 of the text. A review of chapter 1–4 of the text is strongly advised. Areas of emphasis from chapters 5–8 include:

1. Computing definite integrals of functions analytically and numerically.
2. Techniques for analytically obtaining indefinite integrals.
3. Improper integrals;
4. Arc length and surface area; and the geometry of integration.
5. Taylor series and the roles of polynomials.
6. Convergence.

To the extent possible, topics involving differential forms will also be covered.

Detailed weekly assignments are posted online at `http://www.math.usm.edu/kolibal`.

Assessment The course assessment is based on total accumulated points which are earned through papers and examinations. At a minimum, the exams consist of: a quiz, an extended midterm paper stressing problem solving (open book), and a final comprehensive examination stressing proficiency (closed book). Supplementary graded assignments (bonus problems) will also be provided, providing more challenging and interesting problems for solution. Class attendance is required as students will be required to present solutions to weekly chapter problems in class. Homework is not graded, however as the homework problems form the basis for the final exam it is essential to be able to successfully work all assigned problems. Please review the document on grading at `http://www.math.usm/kolibal/courses_html/policies.html` for a detailed synopsis on assessment policy and practices.

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies. Address: The University of Southern Mississippi Office for Disability Accommodations 118 College Drive #8586 Hattiesburg, MS 39406-0001 Voice Telephone: (601) 266-5024 or (228) 214-3232 Fax: (601) 266-6035 Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1-800-582-2233 (TTY) or email Suzy Hebert at Suzanne.Hebert@usm.edu.