Course Information

UTD Applied Calculus II
Math. 1326.502
Wednesday 7 to 9:45 PM
Room GR3.302
Fall 2008

Professor Contact Information

Instructor: Professor Norman Aaron. Professor's email: NAaron_UTD@sbcglobal.net. Office hours: before and after class. Study help: Math. Lab located in MC 2.412. Hours: M-TH, 10 AM until 8 PM; Fri. and Sat.: 10 AM until 2 PM. Also, if there is a TA assigned to this class, the office hours will be announced in class.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisite: A score of at least 4 on the Advanced Placement Calculus AB exam, a score of at least 3 on the Advanced Placement Calculus BC exam, or a grade of at least C- in Math 1325.
Calculator: A scientific calculator is recommended, such as a TI-30Xa. Calculators having alphabetic or graphic displays or stored program capacity are not permitted. Possession of such on an exam or quiz is an academic integrity infraction

Course Description

Applied Calculus II Applications of differential equations, functions of several variables, multiple integrals, and infinite series. .

Chapter 7: Integration: 7.1, 7.2, 7.3, 7.4, 7.5
Chapter 8: Further Techniques and Applications of Integration: 8.1, 8.2, 8.3, 8.4
Chapter 9: Multivariable Calculus: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6
Chapter 10: Solutions of Elementary and Separable Differential Equations: 10.1, 10.2, 10.4
Chapter 12: Sequences and Series: 12.1, 12.2, 12.4

Student Learning Objectives/Outcomes

Students will be able to formulate real world problems into mathematical statements, develop solutions to mathematical problems at the level appropriate to this course and describe or demonstrate mathematical solutions either numerically or graphically.

Required Textbooks and Materials

Textbook: "Calculus with Applications", 9th edition, by Lial, Greenwell and Miller.

Suggested Course Materials

Solution Manuel: Be sure to purchase the student solution manual, associated with the 9th edition, to help with your homework..

Calculator: A scientific calculator is recommended, such as a TI-30Xa

---

Assignments & Academic Calendar

Homework: Your homework problems are indicated below. Odd number problems only are assigned, except as indicated. The answers are given in the back of the book. Help is available in the Math Lab, which is located in MC 2.412. Each student is responsible for completing each homework assignment prior to coming to class. Please note a quiz will be given each class period, based on the prior homework assignments, except when a major test is given.

Homework and Lecture Schedule: The homework is due the class following the associated chapter lecture. There will be a quiz, based on the homework, given at the end of each class period. Problem numbers are for **odd numbered problems** only, except as indicated. Revisions will be announced in class.

8/27 Calculus Readiness Test
Course Introduction and Syllabus Review
Lecture: Review of Differential Calculus, p. 259: 1-7; p. 294: 1-11, 21, 27, 35, 37
7.1 (a): 5 – 21 (power rule w/ const.)

9/3 7.1 (b): 29, 31, 33, 41
7.2: 3-9, 13
Quiz: Diff. Calc. Review, 7.1 (a) (power rule w/ const.)

9/8 Last day to drop without a "W"

9/10 7.3: Calc. area using trapezoid rule for prob.#7 and 9, using n = 4.
7.4: 3, 7, 11
7.5: 1, 7, 9
Quiz: 7.1 (b), 7.2

9/17 8.1: 1, 3, 5, 13
8.2: 1, 5, 9, 25, 27
Quiz: 7.3, 7.4, 7.5

9/24 8.3: For 1, 5, 7, 15, 17, find a) the total money flow (no interest), b) the present value of the total money flow, c) the accumulated amount of money flow (with interest), d) the present value of the accumulated amount of money flow.

Major Test#1: on Rev. of Diff. Calc. and Chaps. 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2
(Be sure to bring your picture ID)

10/1 8.4: 1, 3, 5, 15, 27, 29
9.1: 1, 5, 7, (21-25, refer to page 553 for help)
Quiz: 8.3

10/8 9.2: 1-9, 21, 23
9.3 (a): 3-7
Quiz: 8.4, 9.1

10/15 9.3 (b): 9, 13, 15
9.4: 1, 3, 5 Check each answers to determine if a rel. max. or min.. Refer to the top of p. 584 for the checking procedure
Quiz: 9.2, 9.3(a)

10/22 9.5: 1, 9, 15, 21
9.6 (a): 13, 17, 23, 31
Quiz: 9.3 (b), 9.4

10/23 Last day for undergraduates to withdraw with a WP/WF

10/29: 9.6 (b): 41 - 45
10.1: 1-5, 15, 17, 21, 24, 25, 27

Major Test#2: on Chaps. 8.3, 8.4, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6 (a)
(Be sure to bring your picture ID)

11/5 10.2: 1-9, 13, 17
Quiz: 9.6 (b), 10.1

11/12 10.4: 1, 2 (ans., t = 6.2 yrs.), 3, 4 (ans., D = $142,914.80), 5
12.1: 1, 3, 7, 9, 15, 17, 23, 25, 31, 33
Quiz: 10.2

11/19 12.2: 1, 3, 7 - 29
12.4: 1 -7, 11, 15
Quiz: 10.4, 12.1

11/26 Review for Final
Quiz: 12.2, 12.4

12/3 Open help session for the final exam,

12/17 **Comprehensive final exam, covering the entire course.**
Wed., Dec. 17, 7:15 PM to 10:00 PM., in the regular classroom.
(Be sure to bring your picture ID)

Grading Policy

Examinations: There will be two major examinations and a comprehensive final. In addition, there will be a quiz given each class, except when a major exam is given, based upon your homework assignments. There are no make-ups examinations or quizzes. Missed exams or quizzes will count as zero. All exams, as well as the final, will be given in the regular classroom. On each of the examinations and quizzes, you must show your work. If there is no work shown, there will be no credit. All students must take the final exam at the specified time and place. All electronic devises, other than your scientific calculator, must be turned off and stored away out of sight during quizzes and exams.

Calculation of the Final Grade: There will be a quiz or a major test every class meeting. The grade from the lower of the two major tests will be included in your semester quiz grade average, being equivalent to two quiz grades. The weekly quiz grades plus the lower of the two major tests, counted twice, will be averaged for the semester quiz grade. For the semester grade, the semester quiz grade and the grade of the higher of the two major tests, will count 30%, each, plus the final exam grade will count 40%. This grade will be converted to a numerical grade between 0 and 100. Based on this numerical grade, the letter grade will be determined as follows:

97 - 100 = A +; 94 - 96 = A; 90 - 93 = A -; 87 - 89 = B +; 84 - 86 = B; 80 - 83 = B -; 77 - 79 = C +; 74 - 76 = C; 70 - 73 = C -; 65 - 69 = D +; 60 - 64 = D; 55 - 59 = D -; 0 - 54 = F

Calculation of the Mid-Semester Grade: The mid-semester will be composed of 50% from the class quiz grade and 50% for the first major test grade.

Course & Instructor Policies

Exams There are no make-ups examinations or quizzes. Missed exams or quizzes will count as zero. All exams, as well as the final, will be given in the regular classroom. On each of the examinations and quizzes, you must show your work. If there is no work shown, there will be no credit. All students must take the final exam at the specified time and place. All electronic devises, other than your scientific calculator, must be turned off and stored away out of sight during quizzes and exams.

Calculator: A scientific calculator is recommended, such as a TI-30Xa. Calculators having alphabetic or graphic displays or stored program capacity are not permitted. Possession of such on an exam or quiz is an academic integrity infraction

Technical Support

If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.

Field Trip Policies
Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be

found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD printed publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Series 50000, Board of Regents, The University of Texas System,* and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391) and online at http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-HOPV.html

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student

with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled. The WP/WF withdrawal date is Oct. 23. 2008. You may bring your withdrawal request to me in class or e-mail me a request for withdrawal. Note, all withdrawal paperwork, which may take several days, must be completed by Oct. 23, 2008.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the deal will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:
The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)
disabilityservice@utdallas.edu

If you anticipate issues related to the format or requirements of this course, please meet with the Coordinator of Disability Services. The Coordinator is available to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Services to notify them of your eligibility for reasonable accommodations. Disability Services can then plan how best to coordinate your accommodations.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.

Formulas for Math 1326, Calculus II

(Note: Do not bring this sheet to quizzes or exams)

Chap. 4, Rules for Derivatives

Power rule: $f(x) = x^n, \quad f' = n \cdot x^{n-1}$

Product Rule: $f(x) = u \cdot v, \quad f' = u \cdot v' + v \cdot u'$

Quotient Rule: $f(x) = \frac{u}{v}, \quad f' = \frac{v \cdot u' - u \cdot v'}{v^2}$

Chain Rule: $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$

Exponential Functions: $D_x(e^{g(x)}) = e^{g(x)} \cdot g'(x)$;
$D_x(a^{g(x)}) = (\ln a)\, a^{g(x)} \cdot g'(x)$

Log Functions: $D_x(\ln |g(x)|) = \frac{g'(x)}{g(x)}$;

$D_x(\log_a |g(x)|) = \frac{1}{\ln a} \cdot \frac{g'(x)}{g(x)}$

7.0 Rules for Integration

Power Rule: $\int x^n\, dx = \frac{x^{n+1}}{n+1} + C$

Exponential: $\int e^{kx}\, dx = \frac{e^{kx}}{k} + C; \quad \int a^{kx}\, dx = \frac{a^{kx}}{k \cdot \ln a} + C$

Log: $\int x^{-1}\, dx = \int \frac{1}{x}\, dx + C = \ln |x| + C$

Substitution: $\int u^n\, du = \frac{u^{n+1}}{n+1} + C; \quad \int e^u\, du = e^u + C$

$\int u^{-1}\, du = \int \frac{1}{u}\, du = \ln |u| + C$

Trapezoidal Rule: $A = \frac{1}{2}(h_1 + h_2) \cdot b$

Midpoint rule: $A = h_{mp} \cdot b$

Chap. 8.0, Integration

Integration by Parts: $\int u\, dv = uv - \int v\, du$

Volume of a Solid of Revolution: $V = \int_a^b \pi [f(x)]^2\, dx$

Average Value of a Function: $= \frac{1}{b-a} \int_a^b f(x)\, dx$

(Note: Do not bring this sheet to quizzes or exams)

(Note: Do not bring this sheet to quizzes or exams)

Future and Present Value for Money Flow with Interest Compounding **Continuously**:

Continuous Interest: $A = e^{rt} \cdot P$, or $FV = e^{rt} \cdot PV$

Future Value of Money Flow : $FV_{MF} = \int_0^t f(x)\,dx$

Present Value of Money Flow: $PV_{MF} = (e^{-rt}) \cdot FV_{MF}$

Present Value with interest: $PV_{WI} = \int_0^t f(x)e^{-rx}\,dx$

Future Value with interest: $FV_{WI} = e^{rt} \cdot PV_{WI}$; $FV_{WI} = e^{rt} \cdot \int_0^t f(x)e^{-rx}\,dx$;

Improper Integrals:

$$\int_a^{\infty} f(x)\,dx = \lim_{b \to \infty} \int_a^b f(x)\,dx$$

$$\int_{-\infty}^b f(x)\,dx = \lim_{a \to -\infty} \int_a^b f(x)\,dx$$

$$\int_{-\infty}^{\infty} f(x)\,dx = \int_{-\infty}^0 f(x)\,dx + \int_0^{\infty} f(x)\,dx$$

Capital Value: $\int_0^{\infty} R(t)e^{-rt}\,dx$

Chap. 9.3, Maximum and Minimum

Test for Relative Extrema: $D = f_{xx} \cdot f_{yy} - (f_{xy})^2$

	$f_{xx} < 0$	$f_{xx} > 0$
D > 0	rel. max.	rel. min.
D = 0	. . . . . no information . . .	
D < 0	. . . . . saddle point	

Chap. 9.4 LaGrange Multiplier

$F(x, y, \lambda) = f(x, y) - \lambda \cdot g(x, y)$

Chap. 9.5 Total Differentials

Percent error $= \dfrac{\text{estimated} - \text{actual}}{\text{actual}} \cdot 100$

(Note: Do not bring this sheet to quizzes or exams)

(Note: Do not bring this sheet to quizzes or exams)

Chap. 10.2, Integration Factor

$$\frac{dy}{dx} + P(x) \cdot y = Q(x);\ I(x) = e^{\int P(x)\,dx};\ y = \frac{1}{I(x)} \cdot \left\{ \int [\, I(x) \cdot Q(x) \,]\, dx + C \right\}$$

Chap. 10.4, Applications

Future Value with a Fixed Yearly Deposit and Interest Compounding **Continuously**:

$$FV_{WI} = -\frac{D}{r} + \frac{r \cdot D_0 + D}{r} e^{rt}$$

Chap. 12.1, Geometric Series

Geometric Series: $a_n = a \cdot r^{n-1}$, $S_n = \frac{a(r^n - 1)}{r - 1}$

Chap. 12.2, Annuities for **Periodic** Compounding Interest and Payments

Amount of an Annuity: $S = R \cdot \frac{(1 + i)^n - 1}{i}$;

$$S_{\overline{n}|i} = \frac{(1 + i)^n - 1}{i}$$

Annual Payments for a Sinking Fund: $R = \frac{S}{S_{\overline{n}|i}}$

Present Value of an Annuity: $P = R \cdot \frac{1 - (1+ i)^{-n}}{i}$;

$$a_{\overline{n}|i} = \frac{1 - (1+ i)^{-n}}{i}$$

Chap. 12.4, Infinite Series

Sum of a Geometric Series $= \frac{a}{1 - r}$

(Note: Do not bring this sheet to quizzes or exams)