

MATH 1325.L91 Calculus for Business & Social Sciences

Instructional Syllabus – SPRING 2019: 182S

I. BASIC COURSE INFORMATION:

- A.** MATH 1325 Calculus for Business & Social Sciences: This course is the basic study of limits and continuity, differentiation, optimization and graphing, and integration of elementary functions, with emphasis on applications in business, economics, and social sciences. This course is not a substitute for Math 2313 or 2413, Calculus I.

Prerequisite: MATH 1314 or 1414 College Algebra or Math 1324 Mathematics for Business and Social Sciences

- B.** The intended audience includes students majoring in business, management, economics, or the life or social sciences.
- C. Instructor: Avrila Klaus**
Office: Livingston Teaching Center workroom
Telephone: (903) 841-8694 -- please text or email if no answer
Email: aklaus@angelina.edu
Office Hours: by arrangement

II. INTENDED STUDENT OUTCOMES:

- A. Core Objectives Required for this Course** (Only the core objectives to be assessed are listed.)
- 1. Critical Thinking:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
 - 2. Communication:** to include effective development, interpretation and expression of ideas through written, oral and visual communication
 - 3. Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions
- B. Course Learning Outcomes for all Sections**
1. Apply calculus to solve business, economics, and social sciences problems.
 2. Apply appropriate differentiation techniques to obtain derivatives of various functions, including logarithmic and exponential functions.
 3. Solve application problems involving implicit differentiation and related rates.
 4. Solve optimization problems with emphasis on business and social sciences applications.
 5. Determine appropriate technique(s) of integration.
 6. Integrate functions using the method of integration by parts or substitution, as appropriate.
 7. Solve business, economics, and social sciences applications problems using integration techniques.

III. ASSESSMENT MEASURES

A. Assessments for the Core Objectives

[As required, each core objective shall be assessed using a standardized rubric.] [The judgment of how the objectives were met will be in accordance to the pre-designated “developing” level of attainment for this course. In the paragraphs below, an assignment may be an essay, matching or multiple choice questions.]

- 1. Critical thinking:** Students will be required via written questions (such as essay, matching or multiple choice questions) to demonstrate the proper use of critical thinking.
- 2. Communication:** Students will be instructed in the proper written format and organization of different types of mathematical applications. Students will be instructed how to format and organize visual information (i.e., graphs, tables, etc.). Written responses to written questions will be assessed to determine the level of pertinent knowledge of each student with respect to written, oral, and visual responses.
- 3. Empirical and Quantitative Skills (EQS) –** Students will be instructed on using empirical and quantitative skills and “critical thinking” to draw conclusions from their written, visual, and

oral communications as they apply to real world applications. Written questions will be assessed to determine the level of pertinent knowledge of each student with respect to this objective.

B. Assessments for Course Learning Outcomes

The Course Learning Outcomes for all Sections of para. II. B. are listed below along with how each shall be assessed:

1. Apply calculus to solve business, economics, and social sciences problems. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
2. Apply appropriate differentiation techniques to obtain derivatives of various functions, including logarithmic and exponential functions. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
3. Solve application problems involving implicit differentiation and related rates. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
4. Solve optimization problems with emphasis on business and social sciences applications. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
5. Determine appropriate technique(s) of integration. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
6. Integrate functions using the method of integration by parts or substitution, as appropriate. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.
7. Solve business, economics, and social sciences applications problems using integration techniques. This Learning Outcome will be assessed via written questions (such as essay, matching or multiple choice questions) to determine the level of pertinent knowledge of each student with respect to these outcomes. A course-specific standardized rubric shall be used.

IV. INSTRUCTIONAL PROCEDURES:

The course is taught using a combination of lectures, discussions, and practice exercises. The amount of time spent using any one technique will vary from class to class and from lesson to lesson as determined to be most appropriate by the instructor.

V. COURSE REQUIREMENTS AND POLICIES -

A. Required Textbooks, Materials and Equipment –

1. Required Textbook: **Mathematics with Applications, 12th ed.**, Lial, Hungerford, Holcomb, Mullins, Pearson publisher. An electronic copy is acceptable. Ref. 2 below.
2. **Access to the internet is required to complete the homework. Access to this course will be thru AC's Blackboard. Access codes will be provided by Pearson free for this semester only. Secure codes from your instructor. An e-Text is provided as part of the Pearson's MYMath Lab courses. [This is not a MYLABSPLUS type course.]**
3. Specific equipment required of all students- A graphing calculator with “nDeriv”, “fnInt”, “dy/dx”, $\int f(x)dx$ ”, “Draw:Tangent” or equivalent commands is required. Classroom demonstrations and instruction will support the use of calculator models TI-83+ or model TI-84; hence, one of these models is highly recommended.

4. Additional text(s) and supplementary materials for the individual instructor: See instructor.
5. Specific equipment required by the individual instructor: Cartesian-coordinate Graph Paper, straight edge.

B. Course Policies – This course conforms to the policies of Angelina College as stated in the Angelina College Handbook.

1. Educational Accommodations – If you have a disability (as cited in Section 504 of the Rehabilitation Act of 1973 or Title II of the Americans with Disabilities Act of 1990) that may affect your participation in this class, you may fill out the Educational Accommodations application within your AC Portal, under the “Student Services” tab. A Student Success team member will contact you once the application is received. At a post-secondary institution, you must self-identify as a person with a disability in order to receive services; for questions regarding the application process you can visit the Office of Student Success and Inclusion in the Student Center (Room 200) or email access@angelina.edu. To report any complaints related to accommodations, you should contact Annie Allen, Director of Student Success & Inclusion, in Room 200 of the Student Center. You may also contact Ms. Allen by calling (936) 633-4509 or by emailing aallen@angelina.edu. To report discrimination of any type, contact Steve Hudman, Dean of Student Affairs, at (936) 633-5292 or shudman@angelina.edu.
2. Attendance – Attendance is required as per Angelina College Policy and will be recorded every day. Any student with three (3) consecutive absences or four (4) cumulative absences may be dropped from the class. Records will be turned in to the academic dean at the end of the semester. Do not assume that non-attendance in class will always result in an instructor drop. You must officially drop a class or risk receiving an F. This is official Angelina College Policy.

C. Additional Policies Established by the Instructor

- No eating, drinking, or smoking is allowed in any classroom.
- Children and other guests are not allowed in the classroom. Any child care problems must be handled outside the classroom. Children are not allowed to wait in the hall unsupervised. See Student Services for ongoing problems.
- On most questions on assignments or tests, it is necessary for you to show your work completely. The instructor’s concern is usually with procedures, not just with answers.
- Daily quizzes may be given without notice and cannot be made up. These may include homework quizzes.
- Students are expected to do all assignments and be prepared to discuss them during the next class period.
- *Please turn off beepers, cellular phones, i-pods, and other non-calculator electronic devices and store them out of sight.*
- Students are expected to participate in the class room through courteous, relevant comments and questions.
- Behavior that interferes with the learning environment is not tolerated.
- Any student or students caught cheating (plagiarism, collusion, copying, etc.) on an exam or an assignment will receive a zero for that exam or assignment.
- Conferences outside of class are available by appointment

VI. COURSE OUTLINE:

- A.** See attachment entitled “Course Outline and Topics”

VII. EVALUATION AND GRADING

A. Grading Criteria (percentages, extra credit, etc.) –

1. Your numerical grade will be a weighted average based on the following:
 - a. 3-TESTS: (weight 100 points max. per test). The material tested on exam is given on the “Course Outline and Topics” attached to the end of this syllabus. Make-up exams are not routinely given.
2. Homework and Quizzes: (weight = 1.0 with 100 max. points total).
 - a. Each homework assignment shall be completed within the allotted time.

- b. The homework may be done on your home computer. There are limited campus sites available at the library and at the math labs in Rooms S223 and S110. These may be used on a limited space available basis. (No printing or surfing may be done except in the library.)
3. Final Exam: (weight 100 points max. on the Final)
4. Bonus points: I never *give* extra credit, but I do allow students to *earn* it for work above and beyond the requirements of the class.
5. Note: Those who drop the course on or before the last-date-to-drop will receive a grade of "W". Dropping a course is the student's responsibility.

B. Determination of Grade (assignment of letter grades) –

Total possible points = 300(TESTS) + 100(MML homework) + 100(FINAL EXAM) = 500

Letter grades will be assigned according to the numerical grade scale below:

90% - 100% of the possible points = A (minimum of 450 pts.)

80% - 89% of the possible points = B (minimum of 400 pts.)

70% - 79% of the possible points = C (minimum of 350 pts.)

60% - 69% of the possible points = D (minimum of 300 pts.)

Below 60% of the possible points = F (less than 300 pts.)

The instructor reserves the right to adjust grades upward from this scale.

VIII. SYLLABUS MODIFICATION – The instructor may modify the provisions of the syllabus to meet individual class needs by informing the class in advance as to the changes being made.

FYI

Angelina College's campus security is available 24 hours a day by contacting 936-676-2563. Please use this number only as necessary for security issues.

Should classes for Angelina College be cancelled due to weather emergencies or other contingencies, notification will be available through local television and radio. Notification for day classes will be available by 6:00 am and for night classes by 3:00 pm. You may also call the main switchboard (936-639-1301) for information.

[Math with Applications, L/H/H/M, 12th
ed.]

All homework shall be assigned and
completed online.

1	01/15	Syllabus Review: 3.1 Functions, 3.2 Graphs of Functions 3.3 Applications of Linear Functions [C, R, P, & marginals]	TERMS: Variable cost, fixed cost, revenue, profit, marginal cost, marginal revenue, marginal profit. Graph linear functions via TI YN= feature <u>Bring your calculator to every class.</u>
2	01/17	11.1 Limits [via numerical methods and via limit properties]	Generate numerical function values via TI TABLE or YN{...} .
3	01/22	11.1 Limits continued... 11.2 One-sided limits, infinite limits, & limits at infinity	
4	01/24	11.3 Rates of Change	Average vs. instantaneous & meaning of marginal cost, etc.
5	01/29	11.4 Tangent Lines and Derivatives[via slope or limit definition]	In addition, TI features: Draw Tangent(), nDeriv & dy/dx may be used as per instructor's directions.
6	01/31	Test 1: CH 11.1 – 11.4	
7	02/05	11.5 Techniques for Finding Derivatives[using rules]	Notations for derivatives. RULES: constant rule, power rule, constant times a function rule, sum-or-difference rule
8	02/07	11.7 The Chain Rule [or the rule for taking the derivative of a composite function]	RULES: general chain rule[2 formats], generalized power rule
9	02/12	11.6 Derivatives of Products and Quotients [using rules]	RULES: product rule, quotient rule. TERM: average cost
10	02/14	1.8 Derivatives of Exponential and Logarithmic Functions[by rules]	RULES: e^x , $e^{g(x)}$, $\ln x$, $\ln g(x)$, $\ln g(x) $
11	02/19	11.9 Continuity and Differentiability	Continuity at a point, Continuity on open and closed intervals, relationship between continuity and differentiability
12	02/21	Wrap-up Topics, Complete Class Activity, or Answer Questions	
13	02/26	Test 2: CH 11.5 – 11.9	
14	02/28	12.1 Derivatives and Graphs	TERMS: Intervals on which functions are increasing & decreasing, critical numbers, local extrema, First Derivative Test
15	03/05	12.2 The Second Derivative[and higher derivatives]	Second Derivative Test
16	03/07	12.3 Optimization Applications	TERMS: Extreme-Value Theorem, absolute extrema, The Critical-Point Theorem, economic lot size(optional)
17	03/19	12.4 Implicit Differentiation	TERMS: Explicitly defined function, implicitly defined function
18	03/21	12.5 Related Rates	TERMS: General definition of "related rates"
19	03/26	12.6 Curve Sketching	
20	03/28	Wrap-up Topics, Complete Class Activity,or Answer Questions	*Last day to drop with a W.
21	04/02	TEST # 3 CH 12.1-12.6	
22	04/04	13.1 Antiderivatives	Antiderivative Rules
23	04/09	13.2 Integration by Substitution	May "work" when methods in CH 13.1 do

24	04/11	13.3 Integration by Parts	not May “work” when methods in CH 13.1 and CH 13.2 do not
25	04/16	13.4 Area and the Definite Integral	
26	04/18	13.5 The Fundamental Theorem of Calculus	Relates area under $f(x)=F'(x)$ to the total change in $F(x)$ for $[a,b]$
27	04/23	13.6 Applications of Integrals	
28	04/25	13.6 Applications of Integrals– cont. & Gini Index Activity(opt.)	
29	04/30	Wrap-up Topics, Complete Class Activity, or Answer Questions	
30	Final	COMPREHENSIVE FINAL EXAM CH 11.1 – CH 13.6	