

Angelina College
Science and Mathematics
MATH 2415 Calculus III
Instructional Syllabus

Revised 08/18/2016

I. BASIC COURSE INFORMATION

- A. **Course Description** (as stated in the bulletin, including necessary pre-requisite courses, credit hours)
Mathematics 2315. Calculus III. Three semester hours credit. Infinite series; vectors and vector calculus; partial differentiation, multiple integration, introduction to ordinary differential equations. Three lecture hours each week. Prerequisite: Mathematics 2314.
- B. **Intended Audience**
The intended audience is any Science, Mathematics, or Engineering student.
- C. **Instructor**
Instructor: Ronnie Hall
Office: S-203 C
Office Hours: 2:15 - 3:15 MTWR
Phone: (936) 633-5260
e-mail: rhall@angelina.edu

II. INTENDED STUDENT OUTCOMES

A. Core Objectives Required for this Course

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

Upon successful completion of this course, students will:

1. Perform calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity acceleration, and torsion.
2. Perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals.
3. Find extrema and tangent planes.
4. Solve problems using the Fundamental Theorem of Line Integrals, Greens's Theorem, The Divergence Theorem, and Stokes' Theorem.
5. Apply the computational and conceptual principles of calculus to the solutions of real-world problems.

III. ASSESSMENT MEASURES

A. Assessments for the Core Objectives

1. **Critical Thinking:** Students will complete an out-of-class worksheet. A rubric will be used to assess critical thinking skills and correctness of the project.
2. **Communication:** Students will make a classroom presentation of a calculus problem and will complete an out-of-class worksheet. A rubric will be used to assess oral and visual communication skills during the classroom presentation, and a rubric will be used to assess written communication skills on the worksheet.
3. **Empirical and Quantitative Skills:** Students will complete an out-of-class worksheet. A rubric will be used to assess empirical and quantitative skills and correctness of the worksheet.

B. Assessments for Course Learning Outcomes

1. Students will perform calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity acceleration, and torsion on embedded test questions..
2. Students will perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals on embedded test questions.
3. Students will find extrema and tangent planes on embedded test questions.
4. Students will solve problems using the Fundamental Theorem of Line Integrals, Greens's Theorem, The Divergence Theorem, and Stokes' Theorem on embedded test questions.
5. Students will apply the computational and conceptual principles of calculus to the solutions of real-world problems on embedded test questions.

IV. INSTRUCTIONAL PROCEDURES –

This course will be 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. The graphing calculator will be utilized as appropriate in classroom demonstrations.

V. COURSE REQUIREMENTS AND POLICIES

A. Required Textbooks, Materials and Equipment –

1. Text(s) and supplementary materials
Calculus Concepts and Contexts, by James Stewart (Brooks/Cole), Fourth Edition.
2. Specific equipment required of all students
A TI (Texas Instruments) graphing calculator is required or highly recommended. The TI-84 graphing calculator will be used by the instructor in all classroom demonstrations.

B. Assignments

1. Specific assignments required for all students (term papers, homework, speeches, participation in community activities, etc.)
See the attached: **Course Content and Topics**
2. Appropriate due dates, schedules, deadlines, etc. as determined by the individual instructor
See the attached **Math 2413 Assignments**.

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

1. **Academic Assistance** – 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 should Ms. Sellestine Hunt, Room 200 of the Student Center. At a post-secondary institution, you must self-identify as a person with a disability; Special Student Support Services will assist you with the necessary information to do so. To report any complaints of discrimination related to disability, you should contact Mr. Steve Hudman, Student Center, Room 101 or 936-633-5292.
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 Registrar's Office 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.

Additional Policies Established by the Individual Instructor –

1. Class attendance is necessary. Students are expected to take care of all personal business before the class begins. Leaving class and returning is not permitted.
2. Punctuality is considerate and expected behavior.
3. Class participation, questions, and discussion are encouraged, appreciated, and expected.

4. Pagers, cellular phones, earphones, and similar electronic devices should be silent and out of sight during the entire class period.
5. The instructor's permission is required for the use of tape recorders.
6. Guests not officially enrolled in the course, including children of students, are not allowed in the class.

VI. COURSE OUTLINE: Description of the Course Activities including due dates, schedules, and deadlines.

See attached: COURSE CONTENT AND TOPICS, and MATH 2413 - ASSIGNMENTS

VII. EVALUATION AND GRADING

A. Grading Criteria (*percents, extra credit, etc.*) –

1. Four major exams: 66.7%
Daily grades: 16.7%
Comprehensive final exam: 16.7%
2. Those who drop the course on or before September 9th will not receive a grade for the class. Those dropping between September 10th and November 7th (inclusive) will receive a W in the course. November 9th is the last day for dropping a course. Dropping is your responsibility.
3. No make-up test are authorized. The final exam grade will be used a second time to replace any one missed test or the lowest test grade during the semester.

B. Determination of Grade (assignments of letter grades)

Grades will be assigned according to the scale below.

- 90 - 100% = A
- 80 - 89% = B
- 70 - 79% = C
- 60 - 69% = D
- Below 60% = F

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

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.

Course Content and Topics
Math 2415 - Calculus III

<u>Lesson</u>	<u>Sections</u>	<u>Topics</u>
1	9.5	Equations of Lines and Planes
2	9.6 9.7	Functions and Surfaces Cylindrical and Spherical Coordinates
3	10.1	Vector Functions and Space Curves
4	10.2	Derivatives and Integrals of Vector Functions
5	10.3	Arc Length and Curvature
6		Test 1
7	11.1 11.2	Functions of Several Variables Limits and Continuity
8	11.3 11.4	Partial Derivatives Tangent Planes and Linear Approximations
9	11.5	The Chain Rule
10	11.6	Directional Derivatives and the Gradient Vector
11	11.7	Maximum and Minimum Values
12	11.8	Lagrange Multipliers
13		Test 2
14	12.1	Double Integrals Over Rectangles
15	12.2 12.3	Iterated Integrals Double Integrals Over General Regions
16	12.4 12.5	Double Integrals in Polar Coordinates Applications of Double Integrals
17	12.6 12.7	Surface Area Triple Integrals
18	12.8 12.9	Triple Integrals in Cylindrical and Spherical Coordinates Change of Variables in Multiple Integrals
19		Test 3
20	13.1	Vector Fields
21	13.2	Line Integrals
22	13.3	The Fundamental Theorem For Line Integrals
23	13.4	Green's Theorem
24	13.5	Curl and Divergence
25	13.6	Surface Integrals
26	13.7	Stokes' Theorem
27	13.8	The Divergence Theorem
28		Test 4
29		Review
30		Comprehensive Final Examination

MATH 2415 - ASSIGNMENTS

Fall, 2016

<u>Lesson</u>	<u>Date</u>	<u>Section</u>	<u>Page</u>	<u>Assignments</u>
1	08/24	9.5	670	#'s 1, 3, 5, 7, 11, 12, 14, 16, 17, 19, 21, 25, 33, 39, 41
2	08/29	9.6 9.7	680 686	#'s 1, 3, 5, 9, 11, 14 - 19, 21, 24 #'s 1, 2, 3, 5, 7, 9, 11, 12, 15, 16, 17, 19, 21, 25
3	08/31	10.1*	699	#'s 1 - 6, 8, 9, 11, 12, 15, 16, 17, 19, 21, 25
4	09/07	10.2*	706	#'s 3, 5, 7, 9, 11, 13, 14, 15, 17, 19, 21, 23, 27, 33, 35, 39, 40
5	09/12	10.3	714	#'s 1, 3, 7, 9, 11, 13, 17, 19, 21, 23, 25, 41, 43, 45, 47
6	09/14			Test 1 (9.5 - 10.3)
7	09/19	11.1* 11.2	745 755	#'s 1, 2, 4, 5, 7, 12, 13, 19, 23, 25, 27, 37, 42, 45 #'s 1, 3, 5, 7, 9, 13, 15, 23, 27, 29, 31, 33
8	09/21	11.3* 11.4*	766 778	#'s 1, 3, 5, 11, 13, 15, 19, 23, 27, 31, 35, 39, 41, 45, 47, 51, 53, 59 #'s 1, 3, 5, 11, 13, 15, 17, 23, 25, 27
9	09/26	11.5	786	#'s 1 - 15 odd, 21, 23, 26, 27, 29
10	09/28	11.6*	799	#'s 1, 4, 5, 7, 9, 11, 13, 15, 19, 20, 21, 23, 26, 27, 30, 39, 47
11	10/03	11.7*	809	#'s 1 - 11 odd, 27, 31, 35, 42
12	10/05	11.8	818	#'s 3, 5, 7, 11, 15
13	10/10			Test 2 (11.1 - 11.8)
14	10/12	12.1*	837	#'s 1, 5, 7, 9, 11, 12, 13, 17
15	10/17	12.2* 12.3	843 850	#'s 1, 5, 9, 13, 15, 19, 21, 25, 27, 29 #'s 1, 5, 7, 9, 13, 14, 17, 19, 21, 23, 25, 41, 47
16	10/19	12.4 12.5	857 866	#'s 1, 3, 5, 7, 9, 15, 17, 27 #'s 3, 7, 11, 17
17	10/24	12.6 12.7*	871 880	#'s 1, 3, 5, 7, 8, 9 #'s 3, 5, 7, 9, 13, 17, 27, 35
18	10/26	12.8 12.9	887 898	#'s 1, 3, 5, 7, 9, 17, 19, 21, 35, 37 #'s 1 - 11 odd, 15, 23
19	10/31			Test 3 (12.1 - 12.9)
20	11/02	13.1*	911	#'s 1, 5, 9, 11, 13, 15, 17, 21, 29, 31
21	11/07	13.2*	922	#'s 1, 5, 9, 13, 17, 19, 21
22	11/09	13.3*	932	#'s 3, 5, 7, 13, 15
23	11/14	13.4*	939	#'s 1, 3, 5, 7, 11, 13
24	11/16	13.5	947	#'s 1, 3, 7, 13, 15, 17
25	11/21	13.6	959	#'s 5, 7, 9, 11, 13, 21, 23
26	11/28	13.7	965	#'s 3, 5, 7, 9
27	11/30	13.8	971	#'s 1, 5, 7, 9, 11
28	12/05			Test 4 (13.1 - 13.8)
29	12/07			Review
30	12/12			COMPREHENSIVE FINAL EXAM (11:00 a.m. - 1:00 p.m.)

* Assignments marked with an asterisk are to be turned in for a grade.