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Course Number:	**MTH 122**
Course Title:	**Survey of Calculus and Its Applications II**
Credit Hours:	**4**
Textbook:	**L. Goldstein, D. Schneider, D. Lay, and N. Asmar, *Calculus and Its Applications, 5th custom UB edition.*** 5th custom UB edition consists of chapters 1-10 and 12 of the standard 14th edition, so the standard 14th edition can also be used. The text is available in hardcopy and eBook, both with and without Pearson MyLab Math. **Fall 2021 MyLab Information:** MyLab Math will be used for homework. Be sure to get a bundle or access code that includes MyLab Math access.
Prerequisites:	MTH 121 with recommended grade of C or higher.
Notes:	Continuation of MTH 121. Second part of a two-semester calculus sequence for students in social, biological, and management sciences.
	Trigonometric functions are not usually covered in MTH 121 and are not part of this syllabus for MTH 122. Care should be taken in assigning problems in Chapters 9 and 10.

This schedule is written for 13 weeks of instruction. In a typical semester there are 14 teaching weeks. Thus some flexibility is built in.

Week	Sections	Topics
1	7.1-7.2	Examples of functions of several variables. Partial derivatives.
2	7.3-7.4	Maxima and minima of functions of several variables. Lagrange multipliers and constrained optimization.
3	7.5-7.6	The method of least squares. Double integrals.
4	9.1-9.2	Integration by substitution. Integration by parts.
5		**Review and Midterm Exam 1.**
6	9.3-9.4	Evaluation of definite integrals. Approximation of definite integrals.
7	9.5-9.6	Some applications of the integral. Improper integrals.
8	10.1-10.2,	Solutions of differential equations. Separation of variables.
9	10.5	Graphing solutions of differential equations.
10	10.6-10.7	Applications of differential equations. Numerical solution of differential equations
11		**Review and Midterm Exam 2.**
12	12.1-12.2	Discrete random variables. Continuous random variables.
13	12.3-12.4	Expected Value and Variance. Exponential and Normal Random Variables
14		**Review.**

SAMPLE SYLLABUS
Keep in mind that this is a sample syllabus. Your section will cover the same required topics, but may not cover them on this precise schedule or in this precise order. It may cover additional topics, time permitting. Consult the syllabus for your section or your instructor.

Student Learning Outcomes for
MTH 122 Survey of Calculus and Its Applications II

Assessment measures: weekly homework assignments, 2 midterm exams, final exam.

At the end of this course a student will be able to:	Assessment
– compute and interpret partial derivatives of functions of more than one variable – solve basic optimization for functions of two variables using the second derivative test – solve basic constrained optimization problems – solve least square problems	HW #1, 2, 3 Midterm I Final Exam
– evaluate indefinite and definite integrals of basic functions using integration by parts and integration by substitution – approximate values of definite integrals using midpoint, trapezoid, and Simpson's rules – evaluate simple indefinite integrals	HW # 4, 5, 6 Midterm I, Midterm II Final Exam
– understand the basic form of differential equations and applications of such equations in mathematical models – check if a given function satisfies a given differential equation – solve differential equations by separation of variables – approximate solutions of differential equations using Euler's method	HW # 7, 8,9 Midterm II Final Exam
– understand the notions of sample space, discrete random variable, and probability – understand the notion of a continuous random variable and its density function – compute probabilities associated to continuous random variables using integrals – compute expected value, variance, and standard deviation of discrete and continuous random variables and interpret their values in applications – recognize exponential and normal random variables and understand some applications where such random variables appear – compute probabilities associated to a normal random variable with known mean and standard deviation using tables	HW # 10, 11 Final Exam
– Choose appropriate methods or models for a given problem, using information from observation or knowledge of the system being studied. – Employ quantitative methods, mathematical models, statistics, and/or logic to solve real-world problems beyond the level of basic algebra. – Identify common mistakes and/or limitations in a) empirical and/or deductive reasoning, and b) mathematical, quantitative, and/or logical problem solving. – Interpret mathematical models, formulas, graphs, and/or tables, to draw inferences from them, and explain these inferences.	HW #1-10, Midterm I Midterm 2 Final Exam

SAMPLE SYLLABUS
Keep in mind that this is a sample syllabus. Your section will cover the same required topics, but may not cover them on this precise schedule or in this precise order. It might have more or fewer midterms and/or homework assignments. It might make use of quizzes or other grading instruments not used in this sample, etc. Consult the syllabus for your section or your instructor for the details pertaining to your section.