MA242.601. Fall 2019 Week-by-week Schedule

Week of	Section	Topic
	1.1	Cartesian Coordinates: In 2 and 3 dimensional space
	1.2	Vectors in 2 and 3 Dimensions:
8/21 – 8/23	1.2	Continue study of vectors
	1.3	The Angle Between Two Vectors: The Dot Product
	1.4	The Cross Product:
	1.5	Lines and Planes in 3-dimensional Space
8/26 – 8/30		More on equations of lines and planes
9/2	Monday	Holiday
	2.1	The Calculus of Vector-valued Functions: Limits, derivatives and integrals
9/3 – 9/6	2.2	Parameterized Curves in Space: Newton's second law. Free fall under gravity.
	2.2	Projectile motion under gravity.
	2.3	Fundamental Quantities Associated with a Curve: Tangent vectors, arc length and curvature
	2.4	The Intrinsic Geometry of Curves in 3-Space; curvature and the **osculating plane**
	2.4	More on the geometry of curves in space; the **osculating circle**
9/9 – 9/13	2.5	The decomposition of the acceleration vector into its normal and tangential components and the formula $\vec{a}(t) = \frac{dv}{dt}(t)\hat{T}(t) + \kappa(t)v^2(t)\hat{N}(t)$
		Multivariable Functions: Material up through level curves
September 17	Tuesday	TEST #1 **THREE DAY WINDOW: 9/13, 9/16, 9/17. (F, M, T)**
	3.1	Level surfaces of functions of 3 variables. Parametric surfaces.
9/18 – 9/20	3.2	Limits and Continuity: Theorems on limits; Continuity;
	3.3	Directional Derivatives: Partial derivatives; higher derivatives;
	3.3	Geometrical interpretation of partial derivatives; Tangent plane to the graph of f(x,y)
	3.4	Differentiability of multivariable functions: Definition; Differentiability and continuity; Theorem 9 on characterizing differentiability.
	3.5	The Directional Derivative and the Gradient: Formula for the directional derivative in terms of the gradient (Corollary 2).
9/23 – 9/27		What does the gradient vector say about a function?
9/30 – 10/04		The Chain rules for multivariable functions

	3.5	Tangent planes to graphs z = f(x,y); The general chain rule
	3.6	Optimization: local and global extreme values of f(x,y)
	3.6	More on extreme values
	4.1	Double Integrals over a rectangle as a limit of Riemann sums
		Fubini's Theorem for double integrals over rectangles; iterated integrals
10/7	4.1	More on Fubini's Theorem
10/8	Tuesday	Review in Problem Sections
10/9	Wednesday	Test #2 **THREE DAY WINDOW: 10/7, 10/8, 10/9. (M,T,W)**
10/10 – 10/11	Thur. – Fri.	Fall Break
10/14 – 10/18	4.1	Double integrals over general regions
	4.1	Reversing the order of integration;
	4.2	Applications of Double Integrals
		More on applications of double integrals
10/21 – 10/25	4.3	Triple Integrals in Cartesian Coordinates: Over rectangular solid regions
		Triple integrals over z-simple regions
		Triple integrals over x- and y- simple regions
		Applications of Triple Integrals
10/28 – 11/01	5.1	Double Integrals in Polar Coordinates: over polar rectangles
		Double Integrals in Polar Coordinates over general regions
	5.2	Triple Integrals in cylindrical coordinates
11/04	5.3	Triple integrals in spherical coordinates
11/06	5.3	More on triple integrals in spherical coordinates
11/07	Thursday	TEST #3 **THREE DAY WINDOW: 11/6, 11/7, 11/8 (W, TH, F)**
11/08	6.1	Vector Fields
11/11 – 11/15	6.2	Line Integrals of functions
	6.3	Line Integrals of vector fields; The Fundamental Theorem for Line Integrals
		Conservative vector fields and potential functions; Conservation of total energy
11/18 – 11/22	6.4	Parametric Surfaces in Space: graphs, spheres and cylinders
	6.5	Surface Integrals: Surface Area of a Parametrized Surface
		Tangent planes to parametric surfaces
	6.5	Surface Integral of a Vector Field
	7.1/7.2	Integral Curves of Vector Fields & The Divergence of a Vector Field

11/25	7.3	The Curl of a Vector Field
11/26	Tuesday	Test #4 **TWO DAY WINDOW: 12/25, 12/26 (M,T)**
11/27 – 11/29		Thanksgiving Vacation
12/2	7.3	Green's theorems
12/4	7.4	The Divergence Theorem
12/6	7.5	Stokes' Theorem
	12/11, 12/12, 12/13	**FINAL EXAM: THREE DAY WINDOW: 12/11, 12/12, 12/13 (W,TH,F)**