

Course Guide Calculus III: Fall 2014:

	Day	Topic	My notes	Sections in Salas, Hille and Etgen and comments	Assignment due
M: 8-18	1	vectors, points, components	11-20	12.1, 12.2, 12.3	
T: 8-19	2	dot products, angles, projections	20-30	12.4	
W: 8-20	3	cross product	31-39	12.5	
TH: 8-21	4	lines and planes	40-53	12.6, 12.7	
F: 8-22	5	additional examples			
M: 8:25	6	curves	54-67	9.1, 9.2, 9.6	
T: 8-26	7	surfaces	68-79	14.1*, 14.2, 14.3	Mission 1
W: 8-27	8	curvilinear coordinates	80-88	9.3, 9.4	
TH: 8-28	9	curvilinear coordinates	80-88	text not a good option here	
F: 8-29	10	calculus of curves	93-105	13.1, 13.2	
M: 9-1	11	arclength	106-110	9.8, 13.4	
T: 9-2	12	geometry of curves	110-120	13.3, 13.7	
W: 9-3	13	geometry of curves	110-120	13.3, 13.7	Mission 2
TH: 9-4	14	3D motion	121-131	13.5	
F: 9-5	15	Quiz I (may bring a 3"x5" card of formulas)		This quiz focuses on material from Days 1-14.	
M: 9-8	16	Questions?			
T: 9-9	17	TEST I (may bring a 3"x5" card of formulas)		Covers Chapters 1 and 2 of my notes.	
W: 9-10	18	open sets and limits for several variables	135-150	14.5, 14.6	
TH: 9-11	19	directional derivatives & partial differentiation	153-162	14.4, 15.1, 15.2	
F: 9-12	20	directional derivatives via partial differentiation	162-167	14.4, 15.1, 15.2	
M: 9-15	21	gradient vector field, level curves, contour plots	167-174	14.4, 15.1, 15.2	
T: 9-16	22	partial diff. with three-variables & applications	175-184	14.4, 15.1, 15.2	
W: 9-17	23	general concept of differentiation	185-197	not in text, but explains big picture and is not too hard.	Mission 3
TH: 9-18	24	chain rules	198-211	15.3**	
F: 9-19	25	tangent spaces of graphs, parametrized surfaces & level surfaces.	212-218	15.4	
M: 9-22	26	tangent spaces of graphs, parametrized surfaces & level surfaces.	212-218	15.4	
T: 9-23	27	differentials and constrained partial diff.	219-226	15.7 (my notes take a markedly different path here)	
W: 9-24	28	exact differential equations	n/a	15.8 and 15.9 (I think this is a worth addition to my story arc)	
TH: 9-25	29	additional examples			
F: 9-26	30	Quiz II (may bring a 3"x5" card of formulas)		This quiz focuses on focuses on material from Days 18-29	Mission 4
M: 9-29	31	Questions?			
T: 9-30	32	TEST II (may bring a 3"x5" card of formulas)			
W: 10-1	33	gradients in curvilinear coordinates	227-229	not in text, but simple application of chain rules and vectors	
TH: 10-2	34	Lagrange multipliers	237-251	15.6, note: the quadratic form example is unique to my notes	
F: 10-3	35	multivariate Taylor	252-257	not in text, but simple application of chain rule and series	
M: 10-6	36	second derivative test	258-264	15.5, my notes contain much more detail as to why true	
T: 10-7	37	closed set test	265-269	15.6	
W: 10-8	38	additional examples			
Fall Break		no class 10-9 & 10-10	Fall Break		
M: 10-13	39	definition and basic multivariate integrals	273-278	16.1, 16.2 (better than my notes, nice pictures)	Mission 5
T: 10-14	40	double integrals and TYPE I and II regions	279-295	16.3	

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W: 10-15	41	cartesian triple integrals	296-305	16.6, 16.7	
TH: 10-16	42	change of variables for double integrals	306-318	16.4, 16.5, 16.10	
F: 10-17	43	change of variables for triple integrals	319-330	16.8, 16.9, 16.10	
M: 10-20	44	Quiz III (may bring a 3"x5" card of formulas)		This quiz focuses on focuses on material from Days 35-43	
T: 10-21	45	algebra and geometry of volume elements	331-333	differential forms just in my notes, geometry in text partly	Mission 6
W: 10-22	46	Questions?			
TH: 10-23	47	TEST III (may bring a 3"x5" card of formulas)			
F: 10-24	48	vector fields and the gradient operator	337-344	17.8	
M: 10-27	49	line integrals	345-352	17.1, 17.2, 17.4	
T: 10-28	50	conservative vector fields	353-356	15.8 in retrospect, 17.3	
W: 10-29	51	Green's theorem	357-367	17.5	
TH: 10-30	52	Green's theorem	357-367	17.5	
F: 10-31	53	conservative vector fields	368-371	15.8 in retrospect, 17.3	
M: 11-3	54	surface integration	372-382	17.6, 17.7	
T: 11-4	55	surface integration	372-382	17.6, 17.7	Mission 7
W: 11-5	56	Stokes' theorem	383-392	17.10	
TH: 11-6	57	Stokes' theorem	383-392	17.10	
F: 11-7	58	Gauss' Theorem	393-402	17.9	
M: 11-10	59	Gauss' Theorem	393-402	17.9	
T: 11-11	60	Green's identities and Helmholtz theorem	403-407	see Susan Colley's Vector Calculus for other source	
W: 11-12	61	Application to Electromagnetism Fields	408-410	haven't found in text, but standard application of Chapter 17	
TH: 11-13	62	Application to Electromagnetism Potentials	410-412	haven't found in text	
F: 11-14	63	Quiz IV (may bring a 3"x5" card of formulas)		This quiz focuses on focuses on material from Days 48-62	
M: 11-17	64	additional examples			
T: 11-18	65	additional examples			Mission 8
W: 11-19	66	Questions?			
TH: 11-20	67	TEST IV (may bring a 3"x5" card of formulas)			
F: 11-21	68	further examples			
		Thanksgiving Break:		no class 11-24 to 11-28	
M:12-1	69	further examples			
T: 12-2	70	further examples			
W: 12-3	71	further examples			
		Final Exam (may bring your 4 cards)		Comprehensive.	

❖ **Grades:** Tests 1,2,3,4 = 4(100pts)=400pts, Final = 280pts, Missions = 240pts, Quizzes = 40pts, In-Class Exercises & Participation 40pts.

* in Salas and Hille Section 14.1 the concept of a function of several variables in introduced. I did not attempt such a section in my notes. I assume the reader knows the definition of a function in general; a function is a single-valued assignment of elements in the domain to elements in the codomain.

** The Mean Value Theorem is worthwhile reading here, my current notes lack this theorem.