

Tentative Course Guide Calculus of Higher Dimension: Fall 2020 (online):

This online course is offered mostly asynchronously. However, I do expect you follow along to keep up each week. The guide below indicates the flow of material and one possible study plan. Notice that “Math Battles” and “Tests” require a common Zoom meeting. It is important to communicate with me so we can set these up properly. I am hoping our initial Zoom meeting (8/16/2020) helps set the stage for success this term. The “Missions” are the required homework and their due dates are given in the schedule below.

Both my notes and the Missions for this course will be posted in Blackboard. I will also post solutions to the Missions so it is crucial they be completed according to schedule so I do not have to delay sharing the solution with your fellow classmates.

Missions (130pts) are required homework which I provide in pdf format. I expect you to provide me a solution in the same fashion. Your writing must be clearly readable so please take time to scan the work properly.

Math Battles (50pts) are essentially group quizzes where there is some time pressure. You probably will not be able to complete it all unless you are successful. I plan to post the statement of the Battle in pdf form about 2 hours before we have a Zoom meeting to discuss your answers. I will break you into three groups of two students. However, it is acceptable for these groups to work together if it is convenient.

Tests (360pts) will be given through email or Blackboard once everyone has established a Zoom connection. We will use Zoom to proctor all the Tests and the Final Exam.

Zoom Weekly Meeting (100pts) I am hoping that each week we can talk about questions raised in the lectures of the previous week. I’ll probably ask some low pressure questions about what you learned from watching the lectures posted in the previous week. These meetings will happen on my Sunday night most weeks.

Alabama Date/ CDT	Topic	My notes	Comments	Assignment due
S: 8-16	Initial Zoom Meet and Greet (starts at 10:00pm)			
M: 8-17	vectors, points, components	9 - 18	Lecture 1	
T	dot products, angles, projections	18 - 28	Lecture 1	
W	cross product	28 - 37	Lecture 2	
TH	Lines and planes	38 - 50	Lecture 3	
F	Curves and Surfaces	51 - 75	Lectures 4 and 5	
S: 8-23	Weekly Zoom Review 1 (starts at 10:00pm)			
M: 8-24	curvelinear coordinates	75 - 83	Lecture 6	
T:	calculus of curves	89 - 101	Lecture 7	Mission 1
W:	Arclength	101 - 105	Lecture 9	
TH:	geometry of curves	105 - 115	Lecture 9	
F:	3D motion	115 - 125	Lecture 10	
S: 8-30	Weekly Zoom Review 2 (starts at 10:00pm)			
M: 8-31	3D motion continued	125 - 130	Lecture 10	
T:	Integration along a curve	130 - 134	Lecture 11	

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W:	Integration along a curve	130 - 134	Lecture 11	
TH:	Time to catch up			
F:	Time to catch up			
S: 9-6	Weekly Zoom Review 2.5 (starts at 10:00pm)			
M: 9-5	Time to catch up			
T:	Time to catch up			
W:	Time to catch up			
TH:	Time to catch up			Mission 2
F: 9-9	MATH BATTLE I (you work together on a quiz with time pressure then report your answers to me during Zoom meeting)			
S: 9-13	TEST I (Sunday 10:00pm -11:30pm CDT, which I think is Monday morning for China)		Covers Chapters 1 and 2 of my notes.	
M: 9-14	open sets and limits for several variables	137 - 142	Lecture 12	
T:	open sets and limits for several variables	137 - 142	Lecture 12	
W:	open sets and limits for several variables	143 - 148	Lecture 12	
TH:	directional derivatives & partial differentiation	149 - 157	Lecture 13	
F:	directional derivatives & partial differentiation	149 - 157	Lecture 13	
S: 9-20	Weekly Zoom Review 3 (starts at 10:00pm)			
M: 9-21	directional derivatives via partial differentiation	158 - 162	Lecture 13	
T:	gradient vector field, level curves, contour plots	162 - 169	Lecture 14	
W:	partial diff. with three-variables & applications	170 - 179	Lecture 15	
TH:	general concept of differentiation	180 - 192	Lecture 16	
F:	chain rules	192 - 205	Lecture 17	Mission 3
S: 9-27	Weekly Zoom Review 4 (starts at 10:00pm)			
M: 9-28	tangent spaces & their equations	206 - 212	Lecture 18	
T:	differentials and constrained partial diff.	212 - 219	Lecture 19	
W:	gradients in curvilinear coordinates	220 - 222	Lecture 20	
TH:	Further examples			Mission 4
F: 10-2	MATH BATTLE II (you work together on a quiz with time pressure then report your answers to me during Zoom meeting)			
S: 10-4	TEST II (Sunday 10:00pm -11:30pm CDT, which I think is Monday morning for China)		Covers Chapters 3 and 4 of my notes	
M: 10-5	Lagrange multipliers	231 - 245	Lecture 21	
T:	Lagrange multipliers	231 - 245	Lecture 21	
W:	multivariate Taylor	246 - 251	Lecture 22	
TH:	second derivative test	252 - 257	Lecture 23	
F:	second derivative test	252 - 257	Lecture 23	
S: 10-11	Weekly Zoom Review 5 (starts at 10:00pm)			
M: 10-12	closed set test	258 - 262	Lecture 24	
T:	closed set test	258 - 262	Lecture 24	
W:	definition and basic multivariate integrals	265 - 270	Lecture 25	
TH:	double integrals and TYPE I and II regions	270 - 285	Lecture 25	

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F:	double integrals and TYPE I and II regions	270 - 285	Lecture 25	Mission 5
S: 10-18	Weekly Zoom Review 6 (starts at 10:00pm)			
M: 10-19	cartesian triple integrals	286 - 295	Lecture 26	
T:	cartesian triple integrals	286 - 295	Lecture 26	
W:	cartesian triple integrals	286 - 295	Lecture 26	
TH:	cartesian triple integrals	286 - 295	Lecture 26	
F:	change of variables for double integrals	295 - 307	Lecture 27	
S: 10-25	Weekly Zoom Review 7 (starts at 10:00pm)			
M: 10-26	change of variables for triple integrals	308 - 319	Lecture 27	
T:	algebra and geometry of volume elements	320 - 322	Lecture 28	
W:	Further examples			
TH:	Further examples			Mission 6
F: 10-30	MATH BATTLE III (you work together on a quiz with time pressure then report your answers to me during Zoom meeting, discuss results at 10pm, the assignment will be sent out at my 8:00pm)			
S: 11-1	TEST III (Sunday 10:00pm -11:30pm CDT, which I think is Monday morning for China)		Covers Chapters 5 and 6 of my notes	
M: 11-2	vector fields and the gradient operator	325 - 328	Lecture 29	
T:	On the calculation and properties of grad, curl and div	329 - 332	Lecture 30	
W:	line integrals	332 - 335	Lecture 31	
TH:	line integrals	332 - 335	Lecture 31	
F:	conservative vector fields	335 - 338	Lecture 32	
S: 11-8	Weekly Zoom Review 8 (starts at 10:00pm)			
M: 11-9	conservative vector fields	335 - 338	Lecture 32	
T:	Green's theorem	339 - 345	Lecture 33	
W:	Deformation thm, conservative vector fields	345 - 353	Lecture 34	
TH:	Surface integrals	354 - 364	Lecture 35	
F:	Surface integrals	354 - 364	Lecture 35	Mission 7
S: 11-15	Weekly Zoom Review 9 (starts at 10:00pm)			
M: 11-16	Stokes' theorem	365 - 374	Lecture 36	
T:	Stokes' theorem	365 - 374	Lecture 36	
W:	Gauss' Theorem	374 - 383	Lecture 37	
TH:	wedge product and flux/work form correspondence		Lecture 38	
F:	exterior derivative		Lecture 39	Mission 8
	Thanksgiving Break 11-23 to 11-27			
S: 11-29	Weekly Zoom Review 10 (starts at 10:00pm)			
M: 11-30	integration of forms		Lecture 40	
T:	Generalized Stokes' Theorem		Lecture 41	
W:	Exact and closed forms, application to Physics		Lecture 42	Mission 9
TH:	MATH BATTLE IV (you work together on a quiz with time pressure then report your answers to me during Zoom meeting on Thursday 10:00-11:00pm, CDT)			
	Final Exam (time and date TBA)		Comprehensive	

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❖ **Grades:**

- Tests 1,2,3 = 3(120pts)=360pts,
- Final = 360pts,
- Missions = 130pts,
- Math Battles 50pts,
- Weekly Zoom Review Participation 100pts.

❖ **There are 9 Missions, each problem in these Missions is worth 1pt, there were be at least 130 problems assigned.**

❖ **Math Battles** are as indicated, there is one before each test