

Tentative CVEG 563V Course Schedule – Spring, 2014
(Subject to change by instructor)

Day	Date	Lecture	Topic / Discussion	Reading Assignment	HW Set
M	1/13	1	Course introduction : background on LEFM and fatigue	pg. 3-12	
W	1/15	2	Material cohesive strength and stress concentration near flaws	pg. 25-29	
F	1/17	3	Energy methods and compliance (Griffith theory)	pg. 29-34	1
W	1/22	4	Energy methods and compliance (Griffith theory) (cont.)		
F	1/24	5	The energy release rate, G , (Irwin)	pg. 34-42	
M	1/27	6	The energy release rate, G , (Irwin) (cont.)	pg. 42-52	2 (1in)
W	1/29	7	The stress intensity factor, K	pg. 42-52	
F	1/31	8	The stress intensity factor, K (cont.)	Handout	
M	2/3	9	The stress intensity factor, K (cont.)	Handout	3 (2in)
W	2/5	10	Size Effects	pg. 48-54	
F	2/7	11	Method of superposition	pg. 54-56	
M	2/10	12	Relationship between G and K	pg. 58-61	4 (3in)
W	2/12	13	Crack-tip plasticity: Irwin's model	pg. 61-69	
F	2/14	14	Crack-tip plasticity: strip yield model		
M	2/17	15	Plane strain versus plane stress at the crack tip	pg. 72-80	5 (4in)
W	2/19	16	K as a fracture criterion	Handout	
F	2/21	17	K as a fracture criterion (cont.)		
M	2/24	18	Review Day	Handout	6 (5in)
W	2/26	19	Critical crack size	Handout	
F	2/28	20	Critical crack size (cont.)	Handout	
M	3/3	21	Mixed-mode fracture	pg. 80-85	
W	3/5	22	Experiments for determining material fracture toughness	pg. 299-329	6in
F	3/7	23	MIDTERM EXAM (in class – 2 hours)		
M	3/10	24	Concepts of elastic-plastic fracture mechanics (EPFM)	Handout	7
W	3/12	24	Concepts of elastic-plastic fracture mechanics (EPFM)		
F	3/14	25	Introduction to Fatigue	Handout	
M	3/17	26	Case Studies in Fatigue Failure	Handout	8 (7in)
W	3/19	27	Case Studies in Fatigue Failure		
F	3/21	28	Fatigue crack growth (Paris law)	Handout	8in
SPRING BREAK					
M	3/31	27	Fatigue crack growth (Paris law)	Handout	9
W	4/2	28	Fatigue life determination using LEFM	Handout	
F	4/4	29	Fatigue life determination using LEFM		
M	4/7	30	Fatigue life determination using LEFM	Handout	10 (9in)
W	4/9	31	S-N curves & Palmgren-Miner linear damage accumulation rule	Handout	
F	4/11	32	Cycle counting methods for variable amplitude loading	Handout	
M	4/14	33	Fatigue life determination under variable amplitude loading	Handout	Project (10in)
W	4/16	34	Fatigue life determination under variable amplitude loading (cont.)	Handout	
F	4/19	35	Fatigue life determination under variable amplitude loading (cont.)		

M	4/21	36	<i>TBD</i>		
W	4/23	37	<i>TBD</i>		
F	4/26	38	<i>TBD</i>		
M	4/28	39	<i>TBD</i>		
W	4/30	40	<i>TBD</i>		Project Presentation
F	5/2	41	Exam Review		
<i>FINAL EXAM (Comprehensive)</i>					