MCE 571 - Theory of Elasticity I

(syllabus available online at dgtaggart.github.io/mce571/syllabus.pdf)

Instructor:	David G. Taggart, 289 Fascitelli, 874-5934, taggart@uri.edu
Time/Location:	Tuesdays 5:00-7:45, Location: 210 Bliss Hall
Office Hours:	TBA, or by appointment
Text:	"Elasticity: Theory, Applications & Numerics," 3rd Edition, by M. H. Sadd, Elsevier, 2014, available free online to URI students (requires URI library login)
Software:	Matlab (free to URI Students)
Grading:	Homework - 30%, Exams (2) - 35% each
Course Objectives:	The course will provide a basic treatment of the formulation of linear elasticity theory and its application to problems of stress and displacement analysis. The fundamental field equations will be developed including strain energy concepts. Applications will involve the solution to problems of engineering interest including two-dimensional problems of plane strain and plane stress, fracture mechanics, torsion, bending and stress concentration, and an introduction to three-dimensional solutions. MATLAB or equivalent software will be used to evaluate and plot particular solutions. Homework will be assigned regularly (see links below) and will be collected and graded.
Course policies:	Students are encouraged to study and work on homework assignments together. Such group activities can lead to productive forms of learning. However, all assignments to be turned in for grading should represent your own work. Submitting work directly copied from another individual or website is plagiarism and is unacceptable. Details on academic integrity can be found at URI Academic Integrity Policy (pages 12-13). Any student with a documented disability is welcomed to request accommodations. If you have any such requests, please contact me as soon as possible. For more information, please contact the Disability Services for Student Office at 874-2098 or visit their web site at www.uri.edu/disability_services.
COVID Information:	The University is committed to delivering its educational mission while protecting the health and safety of our community. While the university has worked to create a healthy learning environment for all, it is up to all of us to ensure our campus stays that way. As members of the URI community, students are required to comply with standards of conduct and take precautions to keep themselves and others safe. Visit web.uri.edu/coronavirus/ for the latest information about the URI COVID-19 response. • Universal indoor masking is required by all community members, on all campuses, regardless of vaccination status. If the universal mask mandate is discontinued during the semester, students who have an approved exemption and are not fully vaccinated will need to continue to wear a mask indoors and maintain physical distance. • Students who are experiencing symptoms of illness should not come to class. Please stay in your home/room and notify URI Health Services via phone at 401-874-2246. • If you are already on campus and start to feel ill, go home/back to your room and self-isolate. Notify URI Health Services via phone immediately at 401-874-2246. If you are unable to attend class, please notify me prior to the start of class.
Course links:	Course web site - dgtaggart.github.io/mce571 (for homework assignments, solutions and lecture notes), Syllabus - dgtaggart.github.io/mce571/syllabus.pdf, URI Brightspace, Textbook Errata (3rd Edition)

Course Outline (tentative)

Week	Dates	Topics	Text Sections	Text Powerpoints
1	9/14	Introduction		Introduction
2	9/21	Mathematical Preliminaries	1.1-1.9	Chapter 1
3	9/28	Displacement and Strain	2.1-2.7	Chapter 2
4	10/5	Stress and Equilibrium	3.1-3.7	Chapter 3
5	10/12	Material Behavior - Linear Elasticity	4.1-4.4	Chapter 4
6	10/19	Formulation and Solution Strategies; Review	5.1-5.7	Chapter 5
7	10/26	**Exam 1**		
8	11/2	Energy Principles	6.1-6.7	Chapter 6
9	11/9	2-D Formulation	7.1-7.6	Chapter 7
10	11/16	2-D Problem Solution	8.1-8.4	Chapter 8
11	11/23	2-D Problem Solution (cont.)	"	
12	11/30	Extension, Torsion & and Flexure	9.1-9.9	Chapter 9
13	12/7	Extension, Torsion & and Flexure	"	
	TBD	**Exam 2**		