**720-417-1**

**Mechanics of Continua, I**

**Fall, 2018-19**

**Syllabus**

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|  | Meeting | Subject | Reading | Problems |
| 1. | Sept. 28 | Introduction, Vectors | Chapter 1 |  |
| 2. | Oct. 1 | Vectors; Tensors | Chapter 2 |  |
| 3. | Oct. 3 | Cartesian Coordinates | 3.1 – 3.4 |  |
| 4. | Oct. 5 |  | 3.4 – 3.6 |  |
| 5. | Oct. 8 | Vector Cross Product | Chapter 4 |  |
| 6. | Oct. 10 | Determinants | Chapter 5 |  |
| 7. | Oct. 12 | Change of Orthonormal Basis | Chapter 6 |  |
| 8. | Oct. 15 | Principal Values and Directions | Chapter 7 |  |
| 9. | Oct. 17 | Traction; Stress Tensor | Chapter 9 |  |
| 10. | Oct. 19 | Principal Values of Stress | Chapter 10 |  |
| 11. | Oct. 22 | Maximum Shear Traction | Chapter 11 |  |
| 12. | Oct. 24 | Mohr’s Circle | Chapter 12 |  |
| 13. | Oct. 26 | Gradient | Chapter 8 |  |
| 14. | Oct. 29 | Current & Reference Configuration | Chapter 13 |  |
| 15. | Oct. 31 | Review |  |  |
| 16. | Nov. 2 | Midterm Quiz |  |  |
| 17. | Nov. 5 | Rate of Deformation and Spin | Chapter 14 |  |
| 18. | Nov. 7 | Geometric Measures of Deformation | Chapter 15 |  |
| 19. | Nov. 9 | Strain Tensors | Chapter 16 |  |

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| 20. | Nov. 12 | Linearized Displacement Gradients | Chapter 17 |  |
| 21. | Nov. 14 | Transformation of Integrals | Chapter 18 |  |
| 22. | Nov. 16 | Conservation of Mass | Chapter 19 |  |
| 23. | Nov. 19 | Conservation of Momenturm | Chapter 20 |  |
| 24. | Nov. 21 | Conservation of Energy | Chapter 21 |  |
|  | Nov. 22 | Thanksgiving |  |  |
| 25. | Nov. 26 | Work-conjugate Stresses |  |  |
| 26. | Nov. 28 | Fluids | Chapter 22 |  |
| 27. | Nov. 30 | Non-linear elasticity | Chapter 23.1 |  |
| 28. | | Dec. 3 | Linearized elasticity | Chapter 23.2 |  |
| 29. | | Dec. 5 | More linearized elasticity | Chapter 23.3 |  |
| 30. | | Dec. 7 | Review |  |  |

**Final Examination. Wednesday, December 12, 3-5 pm.**

Last update: September 13, 2018