

ME 6610-6620 MACHINE DESIGN

1998 Catalog Data: ME 6610-6620. Machine Design. Lec. 3. Cr. 3.
Principles for the design of mechanical systems and their components for strength, fatigue life, reliability, optimum performance, conceptual design and optimization; state of stress; flexural, torsional and polar systems; planar-finite-line, cartesian- and polar-finite stress elements and computer-aided design applications; fatigue design theories for breakage and pitting; power shaft couplings, brakes and clutches; antifriction and sliding bearing design and lubrication.
Prerequisite: ME 3620, ME 4020, or equivalent

Textbook: A.C. Ugural and S.K. Fenster, Advanced Strength and Applied Elasticity, 3rd Ed., Prentice Hall, 1987

References: R.L. Norton, Machine Design: An Integrated Approach, Prentice Hall, 1996
A. Blake, Practical Stress Analysis in Engineering Design, 2nd Ed. Marcel Dekker, 1990.
R.D. Cook, D.S. Malkus and M.E. Plesha, Concepts and Applications of Finite Element Analysis, 3rd Ed., Wiley, 1989
D.L. Logan, A First Course in the Finite Element Method Using Algor, PWS, 1997
J.E. Shigley and C.R. Mischke, Mechanical Engineering Design, 5th Ed., McGraw-Hill, 1989
W.C. Young, Roark's Formulas for Stress and Strain, 6th Ed., McGraw-Hill, 1989

Coordinator: Christopher D. Wilson

Goals: To provide students with the principles of the engineering design process; component design for stiffness, strength, and life; and finite element method for computer -sided design.

Topics:

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| 6610 | 1. | Engineering design process |
| | 2. | Stress and strain |
| | 3. | Criteria for material and structural failure |
| | 4. | Solution methods |
| 6620 | 5. | Further studies in elasticity and finite elements |
| | 6. | Further studies in mechanics of materials and finite elements |
| | 7. | Elastic-plastic behavior |
| | 8. | Nonmetals and composites |

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Date: 1-1-00