

Course: ME 5223 - Materials in Design

Class hours : M - W 11:15 AM to 01:15 PM 321 ME

Course Instructor: S. Ramalingam, 215 MEB

Office hours: 215 ME, 1:00 to 2:00 PM Tu, Th

Teaching Assistant: Srikar Chelikani

Office hours: 11.15 AM to 12.15 PM Tu: ME 290, Th: ME 1124

Reading Assignment:

Week of September 09	Chap. 1 to 3	Ashby*	Introduction, Materials, Processes and Materials Selection Principles
Week of September 14	Chap. 4	Ashby*	Stiffness, Modulus and stiffness-limited design
Week of September 21	Chap. 5 to 6	Ashby*	Plasticity, yielding and yield-limited design.
Week of September 28	Chap. 5 to 6	Ashby*	Fracture, Fatigue and fracture-limited design
Week of October 05	Chap. 9 to 10	Ashby*	Fracture-limited design. Material selection limited by multiple constraints.
Week of October 15	Chap. 11 to 12	Ashby*	Material selection without shape constraints
Week of October 19	Chap. 13 to 14	Ashby*	Material selection with shape constraints.
Week of October 26	Chap. 7 to 8	Ashby*	Process selection principles
Week of November 02	Chapter 1	Crawford**	Polymers, elastomers and mechanical design
Week of November 09	Chapter 2.1 to 2.2	Crawford**	Design with elastomers and Introduction to viscoelasticity
Week of November 16	Chapter 2.2, 2.11, 2.12, 2.13	Crawford**	Modeling Viscoelasticity & BSP
Week of November 23	Chapter 2.2, 2.11, 2.12, 2.14	Crawford**	Time-temperature equivalence
Week of November 30	Chapter 2.5, 2.9, 2.16, 2.17, 2.18	Crawford**	Pseudo-elastic design and design against fatigue of polymers
Week of December 07	Chapters 2.20, 2.21, Handouts	Crawford**	Crazing and Fracture. Design against fracture of polymers
Week of December 14		Handouts	Creep, corrosion and oxidation

* **Ashby:** Materials Selection in Mechanical Design

** **Crawford:** Plastics Engineering

You will need to keep up with these reading assignments even if the lecture/discussion part of the course is not in synchrony with the reading assignment schedule.

Home Work Assignments and exams

	Monday	Wednesday	
Week 1		Sep 09	Course Introduction
Week 2	Sep 14	Sep 16	Home Assignment 1
Week 3	Sep 21	Sep 23	Home Assignment 2
Week 4	Sep 28	Sep 30	Home Assignment 3
Week 5	Oct 05	Oct 07	Home Assignment 4
Week 6	Oct 12	Oct 14	Home Assignment 5
Week 7	Oct 19	Oct 21	Home Assignment 6
Week 8	Oct 26	Oct 28	Mid Term
Week 9	Nov 02	Nov 04	Exam Review
Week 10	Nov 09	Nov 11	Home Assignment 7
Week 11	Nov 16	Nov 18	Home Assignment 8
Week 12	Nov 23	Nov 25	Home Assignment 9
Week 13	Nov 30	Dec 2	Home Assignment 10
Week 14	Dec 07	Dec 09	Problem Review
Week 15	Dec 14	Dec 16	Course Review
Final Exam	Dec 17 to Dec 23		Exam 'week'