



## MSE417 Polymeric Materials Class Organization



<b>Course Objectives</b>	Main objective of the course is to present the basic fundamentals on a level appropriate for material science students, so that they understand the relationship between the internal structure of the materials and their properties. They will also be able to have a general view of the factors that affect, change, and control these properties.
<b>Course Contents</b>	Polymer Science (classification, polymer structure, molecular weight, chemical structure and thermal transitions), Polymer Synthesis (step growth polymerization, chain-growth polymerization, polymerization techniques, reactions of synthetic polymers, chemical structure determinations), Conformation, Solutions, and Molecular Weight (polymer conformation and chain dimensions, thermodynamics of polymer solutions, measurement of molecular weight), Solid-State Properties (the amorphous state, the crystalline state, thermal transitions and properties, mechanical properties), Viscoelasticity and Rubber Elasticity
<b>Prerequisite</b>	-
<b>Class Hours</b>	Thursday 10.30 – 13.20
<b>Instructor</b>	Prof. Dr. İ. Ersan Kalafatoğlu,
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<b>Text book</b>	<i>Polymer Science &amp; Technology</i> Joel R. Fried 2nd ed. Prentice-Hall, New Jersey, 2003
<b>References</b>	1- S.L. Rosen, “Fundamental Principles of Polymeric Materials”, John Wiley, 1993. 2- E.A. Grulke, “Polymer Process Engineering”, Prentice Hall, 1994. 3- B. Baysal, “Polimer Kimyası”, ODTÜ, 1994. 4- Ö.T. Savaşçı, N. Uyanık, G. Akovalı, “Plastikler ve Plastik Teknolojisi”, PAGEV, 2002 5- Kauçuk Derneği, “Elastomer Teknolojisi I-II”, 2001
<b>Homework</b>	Two to five after completion of each chapter, due 1 week after distribution.
<b>Office Hours</b>	Thursday 14:30-16:20
<b>Performance</b>	At least 4 Homework assignments, 2 Midterms & 1 Final Exam
<b>Grading</b>	Homework 10 %, Midterm 25 % each, Final 40 %

## SYLLABUS MSE 417

Week	Topics	Sections	Homework
1	Introduction to Polymer Science	CH 1	
2	Polymer Synthesis	CH 2	
3	Polymer Synthesis	CH 2	
4	Polymer Synthesis	CH 2	
5	Conformation, Solutions, and Molecular Weight	CH 3	
<b>MIDTERM EXAM</b>			
6	Conformation, Solutions, and Molecular Weight	CH 3	
7	Conformation, Solutions, and Molecular Weight	CH 3	
8	Conformation, Solutions, and Molecular Weight	CH 3	
9	Solid-State Properties	CH 4	
10	Solid-State Properties	CH 4	
<b>MIDTERM EXAM</b>			
11	Viscoelasticity and Rubber Elasticity	CH 5	
12	Viscoelasticity and Rubber Elasticity	CH 5	
13	Viscoelasticity and Rubber Elasticity	CH 5	
14	Viscoelasticity and Rubber Elasticity	CH 5	