

Materials Science and Technology: MST 456
Introduction to Polymer Processing
Nonstop Since 1946
Lecture Section – Summer 2011 (August 1-5)

Prof. A. J. Giacomin, Univ. of Wisconsin-Madison, USA

Language of Instruction: English

Office: Δ -102 FORTH building

Office Hours: By email appointment

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Lectures: 10-13:00h & 15:00-17:00h; Seminar Room 1, FORTH building

Final Exam: To be announced

Required Text: Middleman, S., *Fundamentals of Polymer Processing*, McGraw-Hill Book Co., New York (1977). TP1087 M5

Prerequisite: Fluid Mechanics or equivalent

Grading:

- | | | |
|----|-------------------------|------------|
| A. | Classroom participation | 200 points |
| B. | Final exam | 200 points |

Conversion to letter grade: A \geq 90, AB \geq 80, B \geq 70, BC \geq 60, C \geq 50, D \geq 40, F \geq 0%

Other Good Books:

Baird, D.G. and D.I. Collias, *Polymer Processing Principles and Design*, Butterworth-Heinemann, Boston (1995). TP1180.T5B26

Bird, R.B., W.E. Stewart and E.N. Lightfoot, *Transport Phenomena*, Revised 2nd ed., Wiley, New York (2007). QA 929 B5 2007

Bird, R.B., R.C. Armstrong and O. Hassager, *Dynamics of Polymeric Liquids, Volume 1, Fluid Mechanics*, 2nd ed., John Wiley & Sons, New York (1987). TA357.D95 1987

Osswald, T.A., *Polymer Processing Fundamentals*, Hanser Publishers, Munich (1998). TP1120.D85

Osswald, T.A. and J.P. Hernández-Ortiz, "Polymer Processing: Modeling and Simulation," Hanser, Munich (2006). TP1087.O87 2006

Tadmor, Z. and C.G. Gogos, *Principles of Polymer Processing*, John Wiley & Sons, New York (1979). TP1087.T32 668

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Day	Assigned Chapter Readings	Subject	Specific Assigned Examples
1	1,2,3	Preface, Polymer Processing, Modeling Philosophy, Continuum mechanics	
2	3	Continuum mechanics, Rheology	
3	5	Simple Model Flows	Ex 5-1
4	6,7,8	Extrusion, Calendering,	Ex 6-1, Ex 6-2, Ex 7-1
5	11	Coating, Injection Molding	Ex 8-1, Ex 11-1, Ex 11-3

Important Dates

First Class
Last Class

August 1
August 5

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One comprehensive OPEN BOOK final exam. Bring text, notes, and calculator. Be organized. Prepare by assigned chapter readings and assigned textbook examples. Everything covered could be on the tests. Subjects emphasized in class or through assigned readings and textbook examples are emphasized on tests.

Grading: Arithmetic errors penalized lightly, except where they indicate conceptual difficulty. Conceptual errors penalized heavily. Wrong answers with no analysis given zero. Make your analysis clear. Always give units.