



**UM 302 August 2:1**

## **Material Processing**

### **Instructor**

Prof Praveen C Ramamurthy and Prof S Subramanian

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### **Teaching Assistant**

Email:

**Department: Materials Engineering for UG**

Course Time: Tue., Thu., 8:30 - 10 AM

Lecture venue: UG class room (old physics building)

Detailed Course Page:

## **Announcements**

### **Brief description of the course**

Basics of polymers and polymer processing

### **Prerequisites**

none

### **Syllabus**

Introduction

- o Polymer Introduction / Definitions
- o Polymer Classification, Nomenclature, Molecular Weights
- â€¢ Polymerization Principles (6 hrs)
  - o Step Growth Polymerization
  - o Chain Growth Polymerization
  - o Ionic Polymerization
  - o Insertion Polymerization
  - o Ring Opening Polymerizations

- o Copolymers

- â€¢ Structure Property Relationships

- o The Chemistry of Polymer Molecules

- o Stereochemistry

- o Polymer Fine Structure Models: Micelles, Folded Chain Crystals,

Crystalline Amorphous Domain Structures

- â€¢ Polymer Processing

- o Injection Molding

- o Extrusion

- o Compression Molding

- o Blow Molding

- o Casting and Spin Coat

- o Calendaring

and other hybrid techniques

### **Course outcomes**

Students will appreciate polymer processing techniques used for various articles.

### **Grading policy**

mid term 10% final exam 10%

lab report 10 % lab exam 10%

### **Assignments**

synthesis of an engineering polymer and a conducting polymer. Characterization of these polymers

### **Resources**

Handouts and softcopies of the textbooks.