POLYMERIC MATERIALS

1.1. Identification

University:	Alma Mater Studiorum – Università di Bologna													
School:	School of Engineering													
Course:	Polymeric materials													
ECTS:	3													
Semester:	*Winter*							*Summer*						X
Category	*Fundamental course*					X		*Specialisation course*						
Module	*MFI*		*MFII*	X	*MFIII*			*MSI*		*MSII*		*MSIII*		
Teachers:	Andrea Saccani													
Language:	*English*	X	*Italian*	X	*Swedish*			*Spanish*						

1.2. Learning-outcomes

This course provides notions on the correlations between chemical, mechanical and thermal behaviour of macromolecules and their structure and microstructure. The complete life-cycle of polymeric material is analysed and discussed. Some choice criteria are also provided.

1.3. Competencies

- **General**
  - to have critical understanding of technical and scientific tools
  - communication skills
  - to work in an international context

- **Specific**
  - to understand polymers properties and their application in the different engineering fields.
  - to understand the relationship between properties, performances and polymeric structure.

1.4. Contents

Macromolecules and their classification. Correlation between structure, molecular weight and thermal properties. Mechanical properties as a function of strain rate and temperature. Crazing and physical ageing. Degradation processes. Rheological behavior in the molten state and chemical structure influence. Plastic recycle. Main polymer processing technologies (extrusion, injection molding, casting, etc.)

1.5. Teaching Methodology

- Lecture sessions

1.6. Evaluation

- oral evaluation

1.7. Bibliography

- P.C. Painter, M. M. Coleman 'Fundamentals of polymer science' Second Edition, Ed. Technomic (1997)
- J. M. G. Cowie ' Polymers: chemistry and physics of modern materials' Ed. Blackie (1996)