



## MAPR2453 Multiphase polymeric materials

[30h+15h exercises] 4 credits

This two-yearly course is taught in 2006-2007, 2008-2009,...

This course is taught in the 2nd semester

**Teacher(s):** Christian Bailly, Sophie Demoustier, Jacques Devaux, Pierre Godard, Alain Jonas, Roger Legras (coord.), Bernard Nysten

**Language:** French

**Level:** Second cycle

### Aims

The main objective of the course is to help students understand the structure and properties of polymeric multiphase materials, chiefly polymer blends and block copolymers. Besides a treatment of equilibrium and non-equilibrium structure development, the course provides numerous examples of systems taken from industrial practice or recent research. The link between processing, structure and properties is emphasized.

### Main themes

Nil

### Content and teaching methods

The course first elaborates on the basic notions pertaining to polymer blends introduced in MAPR 2452. The ubiquitous phase separation of dissimilar polymers in the melt is explained based on thermodynamic considerations. Next, phenomena linked to the presence of interfaces are discussed, in particular morphology development by dispersion and coalescence during melt processing. The structure and properties of block copolymers are contrasted with those of polymer blends. The importance of chemical reactions in the melt for the control of properties and morphology is highlighted. Polymer blend compatibilization is described as an attractive route to new polymeric materials. Many examples taken from industrial practice or scientific literature are presented to illustrate the concepts.

**Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)**

Nil

### Other credits in programs

<b>INCH22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil chimiste	(4 credits)
<b>INCH23</b>	Troisième année du programme conduisant au grade d'ingénieur civil chimiste	(4 credits)
<b>MATR23</b>	Troisième année du programme conduisant au grade d'ingénieur civil en science des matériaux	(4 credits)