Advanced Macromolecular Engineering Methodologies

ECTS	Course (h)
3	18

Mention du master transmettant la fiche UE :	**Chimie et Sciences des Matériaux**
Composante de gestion de l'UE :	**Faculté des Sciences – Département de Chimie**
Responsable de l'UE :	**Eric DROCKENMULLER**
Statut du responsable :	**PR**

REQUIREMENTS

General background on the basics of macromolecular engineering (chain growth polymerizations, step growth polymerizations, linear (co)polymers, elastomers, polymer networks) and classical chemical reactions for the synthesis or chemical modification of polymers.

PROGRAM

The aim is to improve your knowledge in classical macromolecular engineering by presenting the recent trends to develop highly functional polymer materials with dedicated properties. It aims at completing the basic knowledge in macromolecular chemistry and at understanding with a critical view the recent evolutions and most efficient tools recently developed to afford complex tailored macromolecules for dedicated applications.

The program will involve four different sections:

1 – A critical reminder of the general concepts involved in controlled/living polymerization approaches

2 – The introduction to reversible deactivation radical polymerization techniques mediated by light

3 – The historical introduction of the Click chemistry paradigm and its application to macromolecular engineering

4 – The application of photo-Click chemistry to macromolecular engineering

SPECIFIC SKILLS

- Assimilate the recent trends in macromolecular engineering
- Understand the current strategies for the synthesis and chemical modification of polymer materials
- Acquire a critical thinking of the literature devoted to the synthesis and characterization of functional macromolecules
- Manipulate experimental data in scientific articles to provide a comprehensive analysis of the literature
- Illustrate the correlation between functionalities, macromolecular design and high-value applications