

# Molecular structural characterization and analysis

## Titulaires

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## Mnémonique du cours

CHIM-H407

## Crédits ECTS

5 crédits

## Langue(s) d'enseignement

Anglais

## Période du cours

Premier quadrimestre

## Campus

Solbosch et Autre campus

## Pré-requis et co-requis

### Connaissances et compétences pré-requises

Basic knowledge in organic chemistry and intermolecular interactions.

## Méthodes d'enseignement et activités d'apprentissages

Interactive course with powerpoint presentation.

Seminars and practicals illustrate the theory seen during classes.

## Contribution au profil d'enseignement

This teaching unit contributes to the following competences:

- In-depth knowledge and understanding of exact sciences with the specificity of their application to engineering and bioengineering
- A creative, problem-solving, result-driven and evidence-based attitude, aiming at innovation and applicability in industry and society
- The flexibility and adaptability to work in an international and/or intercultural context
- An integrated insight in (bio)chemical process technology and materials' technology
- Insight in chemistry as a link between process and materials technology

## Références, bibliographie et lectures recommandées

### Separation Sciences

[www.chromacademy.com](http://www.chromacademy.com)

*HPLC Columns: Theory, Technology, and Practice*; U.D. Neue Wiley-VCH (1997)

*Contemporary Instrumental Analysis*; K.A. Rubinson and J.F. Rubinson Prentice-Hall (2000)

### Molecular Structure Determination

*Introduction to Organic Spectroscopy*; L.M. Harwood and T.D.W. Claridge

Oxford Chemistry Primers, Oxford Science Publications (1997)  
*Molecular Spectroscopy*; J.M. Brown

Oxford Chemistry Primers, Oxford Science Publications (1998)  
*Spectrometric Identification of Organic Compounds*; R. M. Silverstein, F. X. Webster

John Wiley & Sons Inc (7th edition, 2005 or any other edition)

*Understanding NMR Spectroscopy*, J. Keeler

Wiley-Blackwell; 2nd Edition (2010)

## Contenu du cours

### Introduction

- I. Molecules
- II. Non Covalent Interactions
- III. Importance of Separation Sciences

### A. Separation Sciences

- A.I. HPLC instrumentation and hyphenation to detectors
  - A.II. Types of Liquid Chromatography
  - A.III. Optimization of HPLC separations
  - A.IV. Band broadening in LC
  - A.V. Kinetic performance limits
  - A.VI. Multi-dimensional separations
  - A.VII. Chip Technology
  - A.VIII. Gas chromatography
- B. Molecular Structure Characterization**
  - B.I. Spectroscopy: general considerations
  - B.II. Electronic spectroscopies
  - B.III. Vibrational spectroscopies
  - B.IV. NMR spectroscopy

## Objectifs (et/ou acquis d'apprentissages spécifiques)

The aim of the course is to give you insight into the chromatographic methods available for the isolation and purification of (bio)molecules of industrial importance. In addition, we aim to teach you the fundamentals and application possibilities of different spectroscopic methods available for the determination and characterization of molecular structures.

## Autres renseignements

### Lieu(x) d'enseignement

Solbosch et Autre campus

### Contact(s)

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## Programmes

### Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRBC | Master : bioingénieur en chimie et bioindustries | finalité Spécialisée/bloc 2 et MA-IRMA | Master : ingénieur civil en chimie et science des matériaux | finalité Spécialisée/bloc 1

### Programmes proposant ce cours à la faculté des Sciences

MA-IRBC | Master : bioingénieur en chimie et bioindustries | finalité Spécialisée/bloc 2

