Code: **QO852**

Name: **Introdução à Catálise Assimétrica**

Name in English: **Introduction to Asymmetric Catalysis**

Name in Spanish: **Introducción a la Catálisis Asimétrica**

Subject type: **Asymmetric Catalysis**

Approval Type: Grade and Frequency

Characteristic: Regular

Frequency: 75%

Period Type / Offering period: Semiannual

Requires Final Exam: Yes

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
2						**2**	**15**	**2**

Occurrence on curriculum:

Pre requirement: **QO321 + *QO521**

Summary: Asymmetric induction modes. Catalysis with Lewis acids and bases. Organocatalysis (aminocatalysis, H-Bonding, ion-pairing, and others). Other catalytic systems. Asymmetric induction in enantioselective catalysis. Non-classical interactions between substrates and catalysts. Kinetic resolution and dynamic kynetic resolution. Non-linear effects and auto-catalysis. Bifunctional, dualistic and multifunctional catalytic systems. Desymmetrization reactions. Applications in the preparation of complex molecules.

Program:

1. Introduction to catalysis: definitions, motivations and general considerations
2. Lewis acids and bases
3. Interactions between substrates and catalysts: electronic effects, steric effects, stereo-electronic effects, transition states, physical-chemistry considerations.
4. Resolution methods: definitions, principles, and case studies
5. Non-linear effects and autocatalysis: definitions and case studies
6. Catalysis with metal complexes: definitions, elemental steps and case studies
7. Organocatalysis: definitions, activation modes and case studies
8. Bi- and multifunctional catalytic systems: definitions, elemensts of design and case studies.
9. Examples of applications for the preparation of complex molecules

Basic Bibliography

A) Fudamentals of Asymmetric Catalysis. Patrick J. Walsh, Marisa Kozlowski. University Science Books, 2009.

Supplementary Bibliography

1) Fundamentals of Organometallic Catalysis. Dirk Steinborn, Wiley-VCH, 2011.
2) Asymmetric Organocatalysis: From Biomimetic Concepts to Applications in Asymmetric Synthesis. Albrecht Berkessel, Harald Groger, Wiley-VCH, 2005.