Code: **QO855**

Name: **Química de Produtos Naturais**

Name in English: **Natural Products Chemistry**

Name in Spanish: **Quimica de Productos Naturales**

Subject type: Weekly

Approval Type: Grade and frequency

Characteristic: Regular

Frequency: **75%**

Period Type / Offering period: semi-annual/ Every period

Requires Final Exam: Yes

Vectors

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

Occurrence on curriculum: **09, 39**

Pre requirement: **QO321 + *QO521**

Summary: Introduction to the chemistry of natural products and general considerations. Extraction and isolation methods. Identification methods Primary and secondary metabolism. Biochemical reactions and reaction mechanisms. Elucidation of metabolic sequences. Chemical ecology and plant-plant interaction. Insect-plant interaction. Animal-animal interaction. Carbohydrates. Shikimic acid biosynthetic pathway. Polyketide biosynthetic pathway. Mevalonic acid biosynthetic pathway. Alkaloids.

Program:

1. Origin of natural products (PN). PN analysis. Phenylpropanoids. Flavonoids. Anthocyanins. Flavonois and flavones. Xanthones and stilbenes. Tannins. Quinones. Terpenoids. Essencial oils. Diterpenes. Triterpenes. Carotenoids. Organic Acids. Lipids. Polyacetylenes. Sulfur compounds. Nitrogenous compounds.
2. Chemical ecology definition and adaptation to the environment. Pollination chemistry, plant-animal interaction and plant defense chemistry. Hormonal interactions. Chemical defense and pheromones. Plant-plant interactions and plant-microorganism interactions.
3. Secondary metabolites originating from the shikimic acid pathway.
3.1.Primary and secondary metabolism
3.2. Carbohydrates
3.3. Shikimic acid and phenyl propanoids
3.4. Flavonoids and oxyheterocycles
3.5. Fatty acids, polyacetylenes, acetogins and prostanoids 3.6. Terpenes and steroids
3.7. Alkaloids
3.8. Spectrometry of Natural Products.

Basic Bibliography

1) WALSH C. T.; TANG Y. **Natural Product Biosynthesis: Chemical Logic and Enzymatic Machinery** 2ª ed. Royal Society of chemistry, 2022.
2) DEWICK P. M. **Medicinal Natural Products: A Biosynthetic Approach** 3ª ed. John Wiley & Sons, Ltd. 2009.
3) MANN, J. **Chemical Aspects of Biosynthesis**. Oxford University Press, 2002.

Supplementary Bibliography

1) **Natural Products Reports: A critical review journal, which stimulates progress in all areas of natural products research**.
2) GRABLEY, S. & THIERICKE, R. **Drug Discovery from Nature**, Springer Verlag, 1999.
3) THOMSON, R. H. **The Chemistry of Natural Products**, Blackie Academic & Professional, 2ª edition, 1993.
4) CANNELL, R. J. P. **Natural Products Isolation - Methods in Biotechnology**, Humana Press, 1998.
5) COLEGATE, S.M. & MOLYNEUX, R.J., **Bioactive Natural Products: Detection, Isolation and Structural Determination**, CRC Press, 1997.