Code: **QG950**

Name: **Simetria e suas Consequências na Química**

Name in English: **Symmetry and its Consequences in Chemistry**

Name in Spanish: **La simetría y sus consecuencias en química**

Subject type: **Weekly**

Approval Type: **Grade and Attendance**

Characteristic: **Special topics in chemistry**

Frequency: **75%**

Period Type / Offering period: **Semester / At the discretion of the Education Unit**

Requires Final Exam: **Yes**

Vectors

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

Occurrence on curriculum: **Optative**

Pre requirements: **None**

Summary:

1) **Historical aspects of symmetry and group theory**
2) **Symmetry in art and everyday life.**
3) **Conformation and configuration: Compounds with a chiral center, compounds with two or more chiral centers, axial chirality, planar chirality, and relative and absolute configuration.**
4) **Polarimetry and optical rotation: Circular dichroism and general consequences in electronic spectroscopy.**
5) **Desymmetrization.**

Program:

- History of group theory and the concept of symmetry in chemistry.
- Symmetry in art and everyday objects.
- Molecular stereochemistry: conformation and configuration.
- Molecular chirality: compounds with one or more chiral centers. Axial chirality. Planar chirality.
- Relative and absolute configuration.
- Chirality and experimental techniques: polarimetry, optical rotation, and circular dichroism.
- Symmetry and spectroscopy: general consequences and applications in electronic spectroscopy.
- Desymmetrization.

Basic Bibliography

1) CONSTANTINO, M. G. **Química Orgânica – Curso Básico Universitário.** 1st Ed. Rio de Janeiro: LTC. Vol. 2, 2008

2) HARGITTAI, M.; HARGITTAI, I. **Symmetry through the eyes of a chemist**. 3rd Ed., Dordrecht: Springer, 2009.

3) KETTLE, S. F. A. **Symmetry and structure: readable group theory for chemists**. 2nd Ed., Chichester: John Wiley & Sons, 1995.

Supplementary Bibliography

1) COTTON, F. A. **Chemical Applications of Group Theory**. 3rd Ed. New York: John Wiley & Sons, 1990.
2) CEULEMANS, A. J. **Group theory Applied to chemistry**. 1st Ed., Springer, 2013.
3) MISLOW, K. **Introduction to stereochemistry**. 1st Ed., New York: W. A. Benjamin, Inc., 1966.
4) PAZ, B. M.; DE LUCCA, E. C., JR.; PILLI, R. A. **Simetria molecular e reações de dessimetrização em síntese orgânica**. Química Nova, v. 44, n. 8, p. 1045-1077, Ago. 2021.
5) SIGOLI, F. A.; BISPO, A. G., JR.; DE SOUSA FILHO, P. C. **Lantanídeos: química, luminescência e aplicações**. 1. Ed. Campinas: Átomo, 2022.