Code: **QO857**

Name: **Introdução à Química Verde**

Name in English: **Introduction to Green Chemistry**

Name in Spanish: **Introducción a la Química Verde**

Subject type: Weekly

Approval Type: Grade and Frequency

Characteristic: Regular

Frequency: 75%

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

Requires Final Exam: Yes

Vectors

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

Occurrence on curriculum:

Pre requirement: **AA450**

Summary: Sustainability. History of Green Chemistry. Principles and Metrics. Renewable Raw Materials. Green Solvents. Notions of Catalysis. Prevention of Waste and Reduction of Risks. Examples of the application of Green Chemistry.

Program:

1. Sustainability
2. Historical Introduction and Definition of Green Chemistry
3. The Twelve Principles of Green Chemistry:
3.1. Prevention;
3.2. Atomic Efficiency;
3.3. Safer Synthesis;
3.4. Development of safer products;
3.5. Use of safer solvents and auxiliaries;
3.6. Search for energy efficiency;
3.7. Use of raw materials obtained from renewable sources;
3.8. Avoid the formation of derivatives;
3.9. Catalysis;
3.10. Degradable products;
3.11. Real-time analysis for pollution prevention;
3.12. Safe chemical for the prevention of accidents.
4. Metrics and life cycle analysis
5. Examples of sustainable/green chemistry / technology that have been developed covering the areas of Chemistry including Organic Chemistry, Inorganic Chemistry, Analytical Chemistry, Industrial Chemistry, Polymer Chemistry, Environmental Chemistry and Biochemistry.

Basic Bibliography

1) CORRÊA, A.G.; ZUIN, V.G. Química Verde: fundamentos e aplicações. 1. Ed. São Carlos: Edufscar, 2012. 172 p.
2) ANASTAS, P.T.; WARNER, J.C. Green Chemistry: Theory and Practice. 1. Ed. New York: Oxford University Press, 2000. 152 p.
3) LANCASTER, M. Green Chemistry: an introductory text. 3. Ed. Cambridge: Royal Society of Chemistry, 2016. 392 p.

Supplementary Bibliography

1) OLIVEIRA, K.T.; BROCKSOM, T.J.; PAIXÃO, M.W.; CORRÊA, A.G. Química Orgânica Experimental: uma abordagem de química verde. Rio de Janeiro: Elsevier Brasil, 2017. 200 p.

2) SOUSA, A.C.; ALVES, L.A.; BERTINI, L.M.; NASCIMENTO, T.L. Química verde para a sustentabilidade: natureza, objetivos e aplicação prática. 1. Ed. Curitiba: Appris, 2020. 89 p.

2) SILVA, F.M.; LACERDA, P.S.B., JONES JR., J. Desenvolvimento sustentável e Química Verde. Química Nova, v. 28, n. 1, p. 103-110, Fev. 2005.

3) LENARDÃO, E.J.; FREITAG, R.A.; DABDOUB, M.J.; BATISTA, A.C.F.; SILVEIRA, C.C. Green Chemistry – Os 12 princípios da Química Verde e sua inserção nas atividades de ensino e pesquisa. Química Nova, v. 26, n. 1, p. 123-129, Jan. 2003.

4) GROSS, E.M. Green Chemistry and Sustainability: An Undergraduate Course for Science and Nonscience Majors. Journal of Chemical Education, v. 90, n. 4, p. 429-431, 2013.

5) CORRÊA, A.G.; GALLO, J.M. Biomassa: estrutura, propriedades e aplicações. 1. Ed. São Carlos: Edufscar, 2020. 368 p.