Code: **QI852**

Name: **Química dos Elementos**

Name in English: **Chemistry of the Elements**

Name in Spanish: **Química de los Elementos**

Subject type: **Weekly**

Approval Type: **Grade and frequency**

Characteristic: **Regular**

Frequency: **75%**

Period Type / Offering period: **Semi-annual / All periods**

Requires Final Exam: **YES**

Vectors

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

Occurrence on curriculum:

Pre requirement: QI145 or QI146

Summary: Atomic structure and its relation to the systematic chemistry of the elements. Chemical processes for production and applications of elements and their compounds. Physical and chemical properties of commercial relevant compounds.

Program:

Electronic structure of polyelectronic atoms and the periodic classification of elements.
Metals and their properties: alkaline and alkaline-earth metals; transition metals; lanthanides and actinides. Alloys.
Hydrogen and its compounds; hydrides of elements of groups 13 to 17.
Boron and its compounds; allotropes and clusters.
Carbon group; allotropes, carbides, nanotubes, fullerenes e graphenes; silicon e its compounds; silicates and aluminosilicates.
Nitrogen and oxygen groups; nitrogen and oxygen activation, halides, oxides and sulfides.
Phosphor, phosphates and polyphosphates.
Halogens and noble gases; pseudohalogens and interhalogens, oxygen compounds.
Production of elements and their commercial relevant compounds.
Acidity and basicity of compounds. Oxiacids.
Redox chemistry and potential diagrams.

Basic Bibliography

1) GREENWOOD, N. N.; EARNSHAW, A. **Chemistry of the Elements**. 2ª Ed. Oxford: Butterworth-Heinemann, 1997. 1341p. E-book.
2) WELLER, M.; OVERTON, T.; ROURKE, J.; ARMSTRONG, F. **Química Inorgânica**. 6ª Ed. Porto Alegre: Bookman, 2017. 866p. E-book.
3) LEE, J. D. **Química Inorgânica não tão concisa**. Tradução da 5ª ed. Inglesa. São Paulo: Edgard Blücher, 1999. 527p.

Supplementary Bibliography

1) COTTON, F. A.; WILKINSON, G.; MURILO, C. A.; BOCHMANN, M. **Advanced Inorganic Chemistry**. 6ª Ed. New York: John Wiley & Sons, 1999. 1354p.
2) HOUSECROFT, C.; SHARPE, A. G. **Inorganic Chemistry**. 5ª Ed. Harlow: Pearson, 2018. 1251p.
3) SMITH, D. W**. Inorganic Substances**: A Prelude to the Study of the Descriptive Inorganic Chemistry. Cambridge: Cambridge University Press, 1990. 396p. E-book.
4) TOMA, H. E. **Elementos Químicos e seus Compostos**. São Paulo: Edgard Blücher, 2013. 169p. (Coleção de Química Conceitual, vol. 3). E-book.
5) RAYNER-CANHAM, G.; OVERTON T. **Descriptive Inorganic Chemistry**. 6ª Ed. New York: Freeman, 2014. 691p.