Code: **QG101**

Name: **Química I**

Name in English: **Chemistry I**

Name in Spanish: **Química I**

Subject type: **Weekly**

Approval Type: **Grade and frequency**

Characteristic: **Regular**

Frequency: **75%**

Period Type / Offering period: **semestral**

Requires Final Exam: **yes**

Vectors

T	L	P	O	PE	OE	SL	WEEKS	CREDITS
4	**-**	**-**	**-**	**-**	**-**	**4**	**15**	**4**

Occurrence on curriculum: **04, 08, 10, 11, 13, 34, 41, 43, 49, 108**

Pre requirement:

Summary: Atomic structure, periodic classification, and properties of elements. Chemical bond; structure and properties of substances. Basic concepts of physical chemistry: thermodynamics, chemical equilibrium, and electrochemical cells.

Program:

1. Atomic structure and periodic table.
2. Chemical bond. Covalent bond and ionic bond.
3. Interatomic and intermolecular interactions. Hydrogen bond.
4. Metals, nonmetals, and metalloids. Metallic bond.
5. Laws of thermodynamics and spontaneity of chemical reactions.
6. Solubility. Molecular nature of dissolution. Properties of solutions.
7. Chemical equilibrium. Law of mass action. Equilibrium constant. Thermodynamics and equilibrium.
8. Acids and bases in water. pH. Buffers. Redox reactions. Balancing redox reactions.
9. Reaction rates. Concentration and time. Reaction mechanisms. Reaction models. Catalysis.
10. Conductors and insulators. Intrinsic and doped semiconductors. Inorganic and organic polymers.

Basic Bibliography

1) ATKINS, P., JONES, L. **Princípios de química: questionando a vida moderna e o meio ambiente**. Porto Alegre: Bookman, 2001.
2) MAHAN, B. M., MYERS, R.J. **Química: um Curso Universitário**. 1ª. edição. São Paulo : Blucher, 1995.
3) BROWN, T.L.; LEMAY JR., H.E.; BURSTEN, B.E.; BURGE, J.R. **Química - a ciência central**. 9ª. edição. São Paulo: Pearson Prentice Hall, 2005

Supplementary Bibliography

1) KOTZ, J. C.; TREICHEL, P. **Química e reações químicas.** 3ª edição, Volumes 1 e 2. Rio de Janeiro: Livros Técnicos e Científicos, 1998.
2) RUSSEL, J. B. **Química geral**, 2ª edição, Volumes 1 e 2. São Paulo: Makron Books, 1994
3) SHRIVER, D. F.; ATKINS, P. W.; LANGFORD, C.H. **Inorganic Chemistry.** 2nd. ed. Oxford : Oxford University Press, 1994.
4) LEE, J. D. **Química Inorgânica não tão concisa**. 5ª ed., São Paulo: Edgard Blücher, 1999.
5) CHANG, R, CRUICKSHANK, R. **Chemistry**. 8th edition. Boston: McGraw-Hill. 2005.