

COURSE: Physical Chemistry I			
ACADEMIC YEAR: 2019-2020			
TYPE OF EDUCATIONAL ACTIVITY: Basic			
TEACHER: Prof. Roberto Teghil			
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phone: 0971205768		mobile (optional):	
Language: ITALIAN			
ECTS: (lessons e tutorials/practice) 6	n. of hours: (lessons e tutorials/practice) 48	Campus: Potenza Dept./School: Dipartimento di Scienze Program: CHEMISTRY (L27)	Semester: I (01/10/2019, 20/01/2020)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main goal of the course is to allow a basic knowledge of energy exchanges in equilibrium systems. The learning outcomes will be:

- *Knowledge of the thermodynamic laws concerning energy exchanges among the chemical systems and energy conversion.*
- *Knowledge of the relation between molecular properties and macroscopic systems.*
- *Knowledge of the chemical equilibrium in multi-components systems in the presence of different phases.*
- *Interpretation of phase diagrams for systems containing two, three, and four components.*

PRE-REQUIREMENTS

Grounding in general chemistry.

Mathematical background on differentiation and integration.

SYLLABUS

Block 1: Gases (10 hours)

The properties of gases. The kinetic model of gases.

Block 2: Laws of thermodynamics and thermodynamic functions (18 hours)

Work, heat, and energy. The laws of thermodynamics. The Helmholtz and Gibbs energies.

Block 3: Mixtures and chemical equilibrium (8 hours)

The thermodynamic description of simple mixtures. Chemical equilibrium.

Block 4: Phase diagrams (12 hours)

Phase diagrams of binary systems. Liquid vapor phase diagrams. Liquid-liquid phase diagrams. Liquid solid phase diagrams. Phase diagrams of ternary systems. Phase diagrams of quaternary systems.

TEACHING METHODS

Theoretical lessons.

EVALUATION METHODS

Oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- *P. W. ATKINS, J. DE PAULA, CHIMICA FISICA, ZANICHELLI 2012.*
- *P. W. ATKINS, J. DE PAULA, PHYSICAL CHEMISTRY, OXFORD UNIVERSITY PRESS 2014.*

INTERACTION WITH STUDENTS

Office Hours: 14-15 from Monday to Wednesday at the Laser Chemical Physics Laboratory. The teacher can be also contacted by e:mail.

EXAMINATION SESSIONS (FORECAST)¹

18/02/2020, 24/03/2020, 21/04/2020, 19/05/2020, 23/06/2020, 14/07/2020, 22/09/2020, 20/10/2020, 17/11/2020, 15/12/2020.

SEMINARS BY EXTERNAL EXPERTS YES NO

¹Subject to possible changes: check the web site of the Teacher or the Department/School for updates.

FURTHER INFORMATION

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