DIPARTIMENTO DI SCIENZE

COURSE: **Advanced Physical Chemistry Mod. 2**			
ACADEMIC YEAR: **2016-2017**			
TYPE OF EDUCATIONAL ACTIVITY: **Basic**			
TEACHER: **Prof. Roberto Teghil**			
e-mail: **roberto.teghil@unibas.it**		website:	
phone: **0971205768**		mobile (optional): **3204371096**	
Language: **ITALIAN**			
ECTS: (lessons e tutorials/practice) **5**	n. of hours: (lessons e tutorials/practice) **40**	Campus: **Potenza** Dept./School: **Dipartimento di Scienze** Program: **Chemical Sciences (LM54)**	Semester: **II** (06/03/2017, 15/06/2017)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main goal of the course is to allow a detailed knowledge of the optical properties of solids and of statistical thermodynamics. The learning outcomes will be:

- *knowledge of the optical and electronic characteristics of crystalline solids;*
- *knowledge of the statistical thermodynamics and of its chemical applications.*

PRE-REQUIREMENTS

Background from Bachelor Degree in Chemistry (L27)

SYLLABUS

Block 1: Optical properties of solids (18 hours)

Dielectric and optical properties. Non linear optics. Absorption of radiation in solids. Defects.

Block 2: Statistical thermodynamics (22 hours)

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

Fundamentals of statistical thermodynamics. Maxwell-Boltzmann distribution. Molecular and canonical partition functions. Thermodynamic functions calculated by statistical thermodynamics. Bose-Einstein and Femi-Dirac distributions. Applications.

TEACHING METHODS

Theoretical lessons.

EVALUATION METHODS

Oral examination.

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- *P.A. COX – THE ELECTRONIC STRUCTURE AND CHEMISTRY OF SOLIDS, OXFORD 2003.*
- *P.W. ATKINS, J. DE PAULA – CHIMICA FISICA, ZANICHELLI 2012.*
- *P.W. ATKINS, J. DE PAULA, PHYSICAL CHEMISTRY, OXFORD UNIVERSITY PRESS 2014.*
- *MACZEC – STATISTICAL THERMODYNAMICS, OXFORD 1998.*
- *B.J. MCCLELLAND – STATISTICAL THERMODYNAMICS, JOHN WILEY & SONS 1974.*

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]

21/02/2017, 21/03/2017, 12/04/2017, 23/05/2017, 20/06/2017, 18/07/2017, 19/09/2017, 24/10/2017, 21/11/2017, 19/12/2017.

SEMINARS BY EXTERNAL EXPERTS YES □ NO x

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

FURTHER INFORMATION