DIPARTIMENTO DI SCIENZE

COURSE: METHODS AND SYNTHESIS IN INORGANIC CHEMISTRY	
ACADEMIC YEAR: **2018-2019**	
TYPE OF EDUCATIONAL ACTIVITY: Characterizing	
TEACHER: Dr. SANDRA BELVISO	
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phone:0971 205937/205939	mobile (optional):

Language: Lectures in Italian (English Textbooks are suggested)

ECTS:6 (3 lessons and 3 tutorials/practice)	n. of hours: 60 (24 lessons and 36 tutorials/practice)	Campus: **Potenza** Dept./School: **Dipartimento di Scienze**	Semester: I (date) **from 1/10/2018 to 20/12/2018-20/01/2019**

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

- After attending this course, the students gain theoretical and practical knowledge for working in an inorganic chemical laboratory in a safe and skilled way. They learn the main laboratory techniques and bibliographic research methods necessary for designing and executing inorganic reactions. Furthermore, purification and characterization methods (absorption and emission UV-Vis spectroscopy) are learned and put in practice. The students gain an adequate knowledge about chemistry of transition metal complexes on the basis of a wide theoretical (nomenclature, general properties, bond theories, reactivity) and practical (synthesis and characterization practice) treatment.

PRE-REQUIREMENTS

- General and Inorganic Chemistry – Physical Chemistry

SYLLABUS

- Safety rules. Laboratory techniques and equipments. The manipulation of air-sensitive compounds. Fundamental concepts for transition metal complexes: nomenclature - ground state electronic configurations - physical properties. Structural aspects in *d*-block metal complexes: coordination numbers and geometries - isomerism. Chemical bond in transition metal complexes: the Molecular Orbital Model and the Angular Overlap Model. Spectral and magnetic properties of the transition metal complexes. Selection rules. Electronic spectra of octahedral and tetrahedral complexes. Spectrochemical series. Reaction mechanisms of electron transfer and ligand substitution reactions. Magnetic properties of coordination compounds: diamagnetism and paramagnetism. Magnetic susceptibility. Evans' NMR Method.
  Experimental practice in laboratory: synthesis and spectroscopic characterization of transition metal compounds.

TEACHING METHODS

- Theoretical lessons and laboratory practice

EVALUATION METHODS

- Reports on the laboratory experiments – Final written examination

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- Purcell, K. F.; Kotz, J. C., *Inorganic Chemistry* - Holt-Saunders International Editions
- Miessler G. L.; Tarr, D. A., *Inorganic Chemistry,* Forth Edition – Pearson Prentice Hall, 2011
- Housecroft, C. E., Sharpe, A. G., *Inorganic Chemistry*, Third Edition - Pearson Prentice Hall, 2008
- Atkins P. *et al*., *Inorganic Chemistry*, Fifth Edition - Oxford University Press, 2010
- Shiver, D. F.; Drezdozon, M. A., *The manipulation of air-sensitive compounds* - Wiley, 1986
- Szafran, Z.; Pike, R. M.; Singh, M. M., *Microscale Inorganic Chemistry* - Wiley, 1991

INTERACTION WITH STUDENTS

- Contact by phone or by e-mail – The teacher will receive students in her study (Building 2DA, third floor, room 328) on Tuesday and Thursday (11:00-12.00).

EXAMINATION SESSIONS (FORECAST)[1]

14th February 2019
14th March
16th May
13th June
11st July
26th September
24th October
5th December

SEMINARS BY EXTERNAL EXPERTS YES □ NO X

FURTHER INFORMATION

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