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**COURSE: METHODS AND SYNTHESIS IN INORGANIC CHEMISTRY**

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**ACADEMIC YEAR: 2017-2018**

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**TYPE OF EDUCATIONAL ACTIVITY: Characterizing**

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**TEACHER: Dr. SANDRA BELVISO**

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e-mail: sandra.belviso@unibas.it

website:

phone:0971 205937/205939

mobile (optional):

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Language: Lectures in Italian (English Textbooks are suggested)

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ECTS:6 (3 lessons and 3 tutorials/practice)	n. of hours: 60 (24 lessons and 36 tutorials/practice)	Campus: <b>Potenza</b> Dept./School: <b>Dipartimento di Scienze</b> Program:	Semester: I (date) <b>from</b> <b>02/10/2017 to 15-</b> <b>31/01/2018</b>
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**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**

- Lessons and laboratory practice

**EVALUATION METHODS**

- Reports on the laboratory experiments – Final 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
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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 (10.30-11.30).

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EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

15<sup>th</sup> February 2018  
15<sup>th</sup> March 2018  
17<sup>th</sup> May 2018  
14<sup>th</sup> June 2018  
12<sup>th</sup> July 2018  
4<sup>th</sup> October 2018  
6<sup>th</sup> December 2018

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SEMINARS BY EXTERNAL EXPERTS    YES     NO

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FURTHER INFORMATION

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