Module Name
Advanced Inorganic Chemistry

Type of Module	**Module Code**
Advanced Module	AM-C-AC

Identification Number	**Workload**	**Credit Points**	**Term**	**Offered Every**	**Start**	**Duration**
MN-C-A-AC	180 Hours	6 CP	1. – 3. Semester	SuSe/WiSe	both	1 Semester

1	**Course Types**	**Contact Time**	**Private Study**	**Planned Group Size**
	a) Lecture b) Seminars	60 h	120 h	20-30 Students

2 Module Objectives and Skills to be Acquired

Students who successfully completed this module…

- have acquired detailed knowledge on current aspects of inorganic solid-state-, molecular and coordination chemistry including its overlap with material, biological or medical science,
- are able to analyze on a high level the relation between structures, bonding, and physico-chemical properties of elements and their compounds,
- are able to apply and describe modern synthetic techniques and recognize / analyze chemical properties of solid materials, molecules and coordination compounds,
- are able to refer about challenging and advanced topics from different areas of modern inorganic chemistry,
- are able to perform an in-depth analysis of a specific publication to identify its relevant contents and to bring into context with other studies in this area, and to present the results in form of a brief presentation and discuss them with other students and docents.

3 Module Content

Concise and comprehensive lectures on major areas of inorganic chemistry:

- Molecular chemistry of s- and p-block elements in context with modern bonding theories;
- Coordination chemistry including metal organic complexes: structure and bonding in metal complexes; typical reactions and properties; ligand exchange reactions, activation of ligands, electron transfer, optical and magnetic properties; application of metal complexes in analytics, materials, metal- organic homogeneous catalysis and bio-catalysis;
- Solid-state chemistry and chemistry of nanostructured materials: preparative solid-state chemistry, basic understanding of nanostructures, synthesis of nanomaterials, reactions in the gas phase (chemical transport (CV/CVT), physical and chemical vapor phase synthesis), reactions in solution (precipitation, colloids, sol-gel chemistry, solvo- and hydrothermal syntheses), reactions of metal-organic reagents in materials synthesis, precursor concept.

4 Teaching Methods

Lectures, seminars with student talks

5 Prerequisites (for the Module)

Formal: none
With regard to contents: none

6	**Type of Examination** Written exam (after successful completion of the seminar)
7	**Credits Awarded** Passed written exam
8	**Compatibility with other Curricula** None
9	**Proportion of Final Grade** 6/114
10	**Module Coordinator** Prof. Dr. U. Ruschewitz, Prof. Dr. S. Mathur, Prof. Dr. A. Klein, Prof. Dr. N. N., PD Dr. M. Prechtl
11	**Further Information** Literature as well as seminar topics will be provided via **ILIAS**.