

MATERIALS SCIENCE & SIMULATION

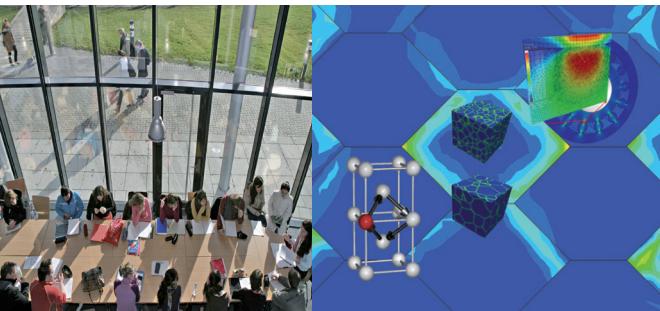
KNOWLEDGE DRIVEN MATERIALS DESIGN

Maintaining and expanding societies' industrial and economic capacity has become increasingly dependent on the rapid availability of sophisticated materials designed for extreme conditions. At the same time, the life-cycles of materials have become shorter due to frequent adaptation to, or even new design for, specific requirements and environments.

Advanced computer simulation as a key tool for increasing the speed of materials development at reduced costs will therefore gain a wide importance in academic and industrial research and development. Theoretical and practical knowledge in numerical methods has proven to be one of the most decisive key qualifications of nationally and internationally successful materials scientists and this development is still to continue.

The Ruhr-University Bochum meets this need for material scientists trained in numerical simulation and experimental characterization and processing techniques by establishing a new Master of Science programme "Materials Science and Simulation".

The programme focuses on providing you with a thorough knowledge in materials science and hands-on experience with state-of-the-art numerical methods. Furthermore it will enable you to apply your practical skills and knowledge in experimental settings already during your studies.



ADMISSION AND APPLICATION

THE REQUIREMENTS FOR ADMISSION TO THE MASTERS COURSE ARE:

- Bachelor (B. Sc.) or comparable degree in one of the following or related disciplines: Materials Science, Mechanical Engineering, Physics, Civil and Environmental Engineering, Electrical Engineering, Chemical Engineering, Power Engineering, Chemistry, Nanotechnology, Mathematics, or Computer Sciences.
- Adequate English language skills, verified by TOEFL, IELTS
- Students with a 7 semester Bachelor's degree have the possibility to apply directly for a 3 semester course, starting every summer term (short track).

APPLICATION DEADLINES:

| | No visa required (e.g. EU citizens) | Visa required |
|--|--|---------------|
| Summer Term starting in April (short-track option) | March 15 | September 15 |
| Winter Term starting in October | September 15 | March 15 |

Further information can be found on the ICAMS Website:

www.icams.de/mss

RUHR-UNIVERSITÄT BOCHUM
ICAMS
Interdisciplinary Centre for Advanced Materials Simulation

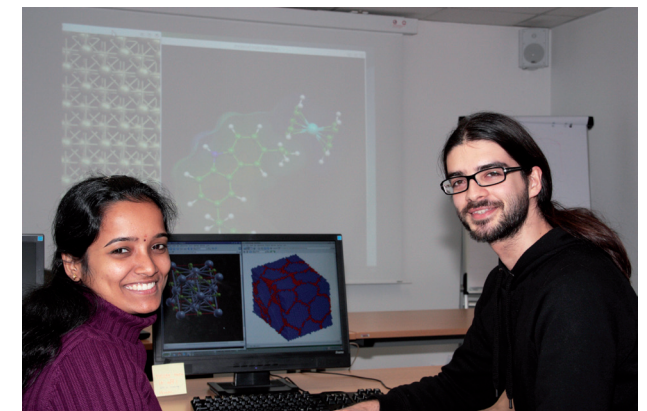
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RUHR-UNIVERSITÄT BOCHUM

RUB

INTERNATIONAL MASTERS COURSE

MSS MATERIALS SCIENCE AND SIMULATION



MATERIALS SCIENCE & SIMULATION

THE COURSE IN BRIEF

The new Master's Course will lead to a Master of Science (MSc) degree. The programme will provide you with:

- a comprehensive knowledge of materials science, physics and numerical methods,
- practical experience and the necessary theoretical background in applying modern numerical and experimental methods on all relevant scales,
- competence to plan and conduct key experiments in modern characterization and processing techniques,
- the ability to apply advanced modelling and simulation methods,
- the build-up of research competence by planning and conducting student research projects,
- a thorough understanding of the interrelation between processing, structure and properties of materials,
- hands-on experience in project-oriented teamwork, project management skills and interdisciplinary communication.

The course combines compulsory lectures in materials science, physics, numerical methods on different length and time scales, and programming. In the specialization areas lectures can be selected from the fields "modelling and simulation" or "processing and characterization". The schedule is given in the table, a complete list of all lectures can be downloaded from icams.de/mss.

| Semester I | Semester II | Semester III | Semester IV | |
|---|--|--|------------------------------------|-------------------|
| Programming Concepts in Materials Science | Quantum Mechanics in Materials Science | Continuum Methods in Materials Science | Master Thesis and Seminar | |
| Elements of Microstructure | Microstructure and Mechanical Properties | Atomistic Simulation Methods | | |
| Basic Lectures (Theoretical Physics or Materials Science) | Advanced Characterization Methods | Free Specialization Module I | | |
| | Module Modelling & Simulation | Free Specialization Module II | | |
| General Optional Lecture | Module Processing & Characterization | Optional Scientific Lecture | | |
| Soft Skills I (e.g. Scientific Writing) | Soft Skills II (e.g. Management Skills) | Research Project and Seminar | | |
| Basic Lectures | Compulsory | Specialization | Research Project and Master Thesis | Optional Lectures |

