



Master Of MATERIALS SCIENCE^[MSI]

University partner



TABLE OF contents

4

Program Introduction

5

Program Curriculum

6

Lab Facility

8

Admission Requirements

9

Scholarship

10

Our Faculty

12

Future outlook

14

Student Life

16

Contact

PROGRAM INTRODUCTION

Welcome to the Master of Materials Science (MSI) program at VGU! This program delivers the true key to innovation: a deep mastery of the fundamentals.

Our foundation-first approach, built in partnership with Otto von Guericke University (OVGU) in Germany, is what makes us different. We don't just teach you about materials; we guide you to master them from the ground up. The MSI program is a two-year, full-time master's degree program that awards the graduates with the prestigious double Master degrees from both VGU and OVGU. The program focuses on understanding the properties of fundamental material classes like metals, ceramics, glass, polymers, and how these properties are influenced by their composition, structure, processing, and applications. It explores the relationship between these aspects and the performance of materials in various engineering contexts.

This unique collaboration ensures our curriculum meets stringent German academic standards and provides you with a truly international learning experience. You'll get to roll up your sleeves and gain hands-on experience in material processing, fabrication, and characterization using world-class facilities. By the time you graduate, you won't just be following trends; you'll have the skills and knowledge to set them, positioning you for success in research and industry.



PROGRAM CURRICULUM

MSI is designed to bridge the gap between fundamental material science and cutting-edge applications. A perfect example is the semiconductor industry, where the world's most advanced technologies are built upon the precise integration of metals, ceramics, glass, and polymers. Within 4 semesters, we will not only show the properties of metals, ceramics, glass and polymers in isolation but how they are engineered to work together to shape the world.

Alongside with the atomistic-depth theory, MSI provides modern tools for practical realization. Research lab guide you through key techniques such as doping, which precisely alters the electrical conductivity of a material, and deposition, which applies ultra-thin layers of material. You will also learn about etching to selectively remove material and planarization to create a perfectly flat surface, all of which are essential for manufacturing at the micro- and nano-scale.

SEMESTER 1

Mandatory

- Materials Science I - Metals
- Solid State Physics
- Heat Treatment of Materials
- Engineering Ceramics
- Continuum Mechanics

Elective

- Technology and Materials
- Material Studies
- Physical and Chemical Sensor Principles
- Entrepreneurship Management

SEMESTER 3

Mandatory

- Micro-Nano Fabrication Technology
- Glass
- Polymers
- Inorganic, Non-metallic Binders
- Team Project

Elective

- FEM application and numerical simulation
- Planning/Constructing of Wastewater Treatment Plants

SEMESTER 2

Mandatory

- Materials Characterization
- Mechanics of Materials and Fracture and Mechanics
- Powder Metallurgy and Sintered Materials
- Research Lab

Elective

- Material Modelling and Simulation
- Production Technology
- Additive Manufacturing
- Basics of Material Technology I
- Managerial Finance and Controlling

SEMESTER 4

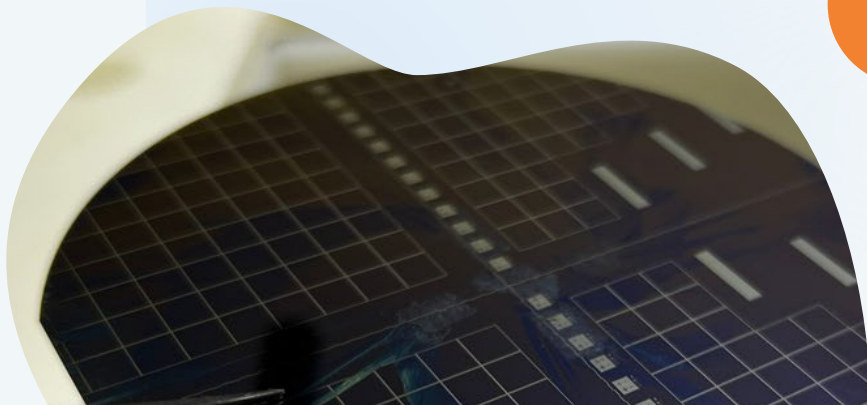
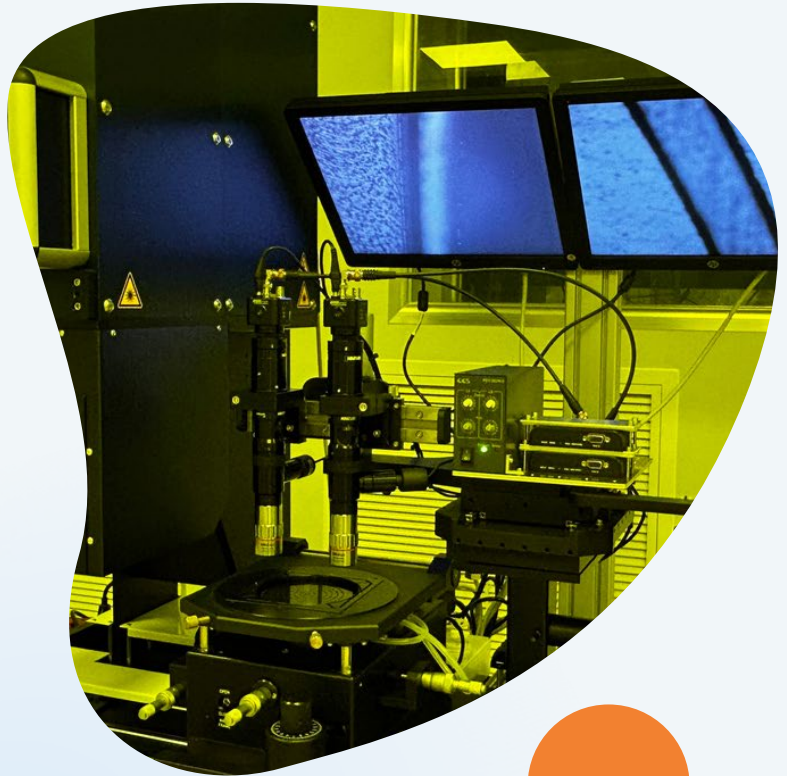
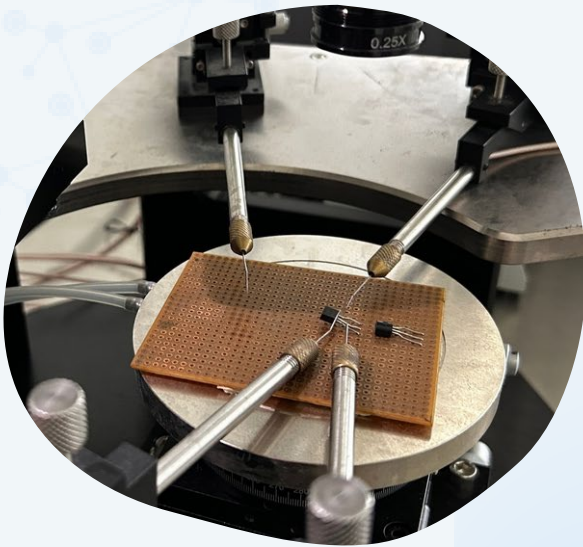
Master Thesis



LAB FACILITY

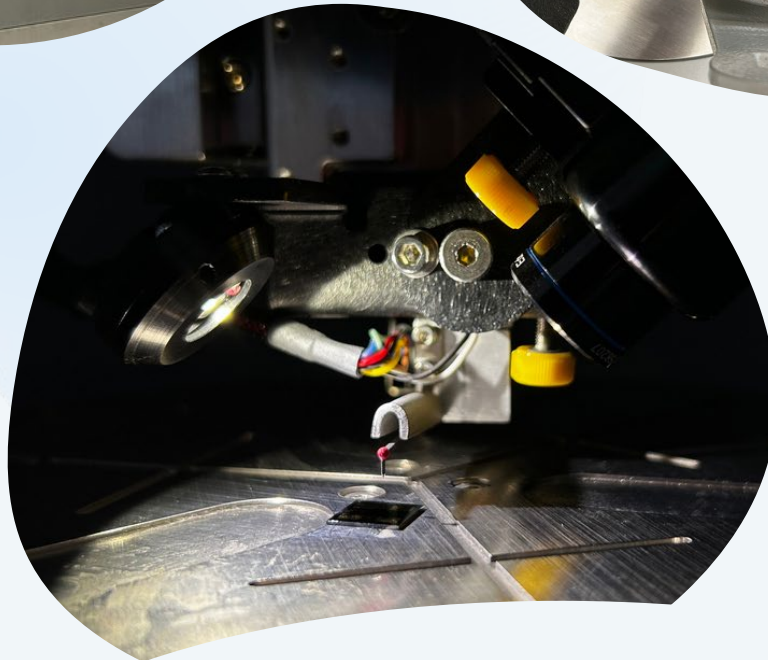
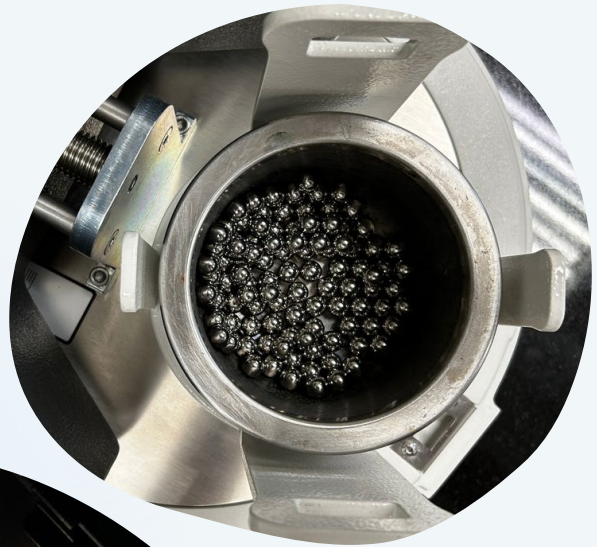
The MSI program's curriculum is centered on the simulation, fabrication, and characterization of materials. In 2018, with a sponsorship of approximately \$4 million from the World Bank, the program established five specialized laboratories that adhere to the stringent standards of OVGU. These laboratories include:

- Powder & Sintering Lab
- Particle & Surface Analysis Lab
- Computational Lab
- Nano & Micro Fabrication Lab
- Clean Room



These facilities are primarily dedicated to educational purposes, providing students with access to advanced instrumentation that is rarely found in a typical academic setting. The utilization of these laboratories is integral to the student experience, supporting both fundamental research and the development of practical skills. The facilities are specifically designed to enable students to simulate material behaviors, fabricate new materials using advanced techniques, and then characterize their properties with high precision. This integrated approach ensures a comprehensive and immersive learning environment.

We are thrilled to mention our ownership of Ansys and CES Edupack software license. With those, students are freely to explore Materials Science at their own pace. Additionally, some significant names of our Lab tools are: SEM machine, Ball Milling, Furnace, Probe Station, Surface Profiler, More can be find at QR to link <https://vgu.edu.vn/vi/laboratories>



A Launchpad for Innovation

From simulating stress fields in metallic components to characterizing nano-coatings on ceramic surfaces, the lab facilities at VGU enable MSI students to work on cutting-edge research, sometimes even leading to international collaborations or conference publications.

HOW TO APPLY?

Admission Requirements

The MSI program seeks highly motivated students with a strong academic foundation in science and engineering. Admission is based on a holistic review of your academic record, personal motivation, and English language proficiency.

Eligibility Criteria

Academic Background: You must hold a completed Bachelor's degree (or equivalent) in one of these fields:

- Materials Science or Engineering
- Chemistry or Chemical Engineering
- Physics or Applied Physics
- Mechanical Engineering
- Or show us your interest via an Motivation letter with a format freely decided by yourself

Academic Standing: A minimum GPA equivalent to 2.5/4.0 (or 6.5/10 in the Vietnamese system).

English Language Proficiency: Applicants must demonstrate English proficiency through one of the following:

- A valid English certificate (IELTS 5.0 / TOEFL PBT 440 / TOEFL iBT 42 or higher).
- A Bachelor's degree from an institution where English is the medium of instruction (considered on a case-by-case basis).
- Passing the VGU English Placement Test (if no certificate is available).

The application period runs annually from **May to August**. Final selection is based on a comprehensive academic interview designed to assess your background, motivation, and interest in the field of Materials Science.

scan to apply



apply.vgu.edu.vn



OUR FACULTY



**Prof. Dr. rer. nat.
Franziska Scheffler**

*Institute of Chemistry (ICH) -
OVGU*



**Prof. Dr.-Ing. habil.
Thorsten Halle**

*Institute of Materials,
Technologies and Mechanics
(IWTM) - OVGU*



**Prof. Dr. rer. NAT.
Michael Scheffler**

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Dr. Ulf Betke

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(IWTM) - OVGU*



Prof. Dr. Holm Altenbach

*Institute of Materials,
Technologies and Mechanics
(IWTM) - OVGU*



Dr. Phan Dang Cuong

*Institute of Glass Science and
Technology - TU Freiberg*



Dr. Nguyen Xuan Thanh

Lecturer - VGU



Dr. Tong Duy Hien

Lecturer - VGU



Dr. Duong Hieu Linh

Lecturer - VGU



Ms. Nguyen Thi Tuu

MSI Faculty Assistant - VGU

FUTURE OUTLOOK

The MSI program is designed to equip you with the skills to excel in both research and industry. Our curriculum and international partnerships provide a strong foundation for your professional future, whether you plan to pursue advanced studies or enter the workforce.

1. Future Research

Through our close partnership with Otto von Guericke University (OVGU) in Germany, our program acts as a bridge to international research in materials science. Students selected for the MSI Research Fellowship, which includes a stay of up to 12 months in Magdeburg, will join interdisciplinary teams working in high-impact research areas.

- **Computational Mechanics:** Explore simulation-based methods to model complex material behavior, including material modeling with neural networks, finite element methods, and biomechanics.
- **Metallic Materials:** Conduct research in metallurgy and material simulation, focusing on topics such as heat treatment, biocompatible metals, and the simulation of microstructure-property relationships.
- **Ceramics & Functional Coatings:** Work with novel ceramic materials for energy, structural, and protective applications, including porous ceramics, high-temperature coatings, and microstructure control.
- **High-Temperature Materials:** Investigate alloys and composites for extreme environments and aerospace applications, focusing on refractory metals, oxidation-resistant materials, and high-performance materials for propulsion.





2. Industry Opportunities

The interdisciplinary training at MSI enables our graduates to thrive in a wide range of technology-driven sectors. Our graduates are well-prepared to build global research networks, pursue PhD pathways, and contribute to innovation in various industries.

Key Industries:

- Automotive: Contributing to materials for structural safety, coatings, and composites.
- Biomedical: Developing polymers, ceramics, and nanomaterials for implants and diagnostics.
- Aerospace: Working with lightweight alloys, thermal barrier coatings, and high-temperature ceramics.
- Semiconductor & Electronics: Innovating with dielectrics, conductive materials, and optical coatings.
- Advanced Manufacturing: Specializing in additive manufacturing, surface engineering, and corrosion control.
- Sustainability & Energy: Researching battery materials, thermoelectrics, and recyclables.

Potential Career Paths

Graduates of the MSI program are prepared for roles such as:

- R&D Engineer / Materials Scientist
- Product Development Engineer
- Process & Quality Control Engineer
- Simulation Specialist / FEM Analyst
- Technical Sales Engineer (Materials/Testing Equipment)
- Lab Manager or Project Engineer

STUDENT LIFE

Life as an MSI student at Vietnamese-German University (VGU) is not only about academic excellence, but also about experiencing a safe, supportive, and inspiring campus environment. From affordable student housing to a convenient campus bus system and access to modern amenities, VGU offers a complete and enriching student experience.

Student Dormitory

- On-campus dormitories are available for local and international students.
- Rooms are clean, secure, and affordable, typically 2–3 students per room, with shared kitchen and laundry.
- Distance to lecture halls: 5–7 minutes' walk.
- Ideal for community building and academic collaboration.



Campus Shuttle Bus

- VGU provides daily bus routes between Ho Chi Minh City (the turtle lake, district 1) – Thu Dau Mot – VGU Campus.
- Multiple pick-up/drop-off points across the city ensure convenient access for students living off-campus.
- Safe, reliable, and environmentally friendly transport.

Campus Amenities

- Library with digital & physical collections, quiet study zones, and research terminals
- Modern laboratories for materials testing, simulation, microscopy, fabrication
- Cafeteria & Coffee Zone with affordable meals and student-friendly atmosphere
- Sports facilities including outdoor basketball and mini-football courts
- Student Clubs & Events for cultural, academic, and social engagement



TESTIMONIAL

"Due to my non-materials science background, the MSI Lab allowed me to use the SEM for the first time. It felt like materials science became real!"

Tung, MSI Student 2024 Intake

"Having experienced and expert professors instruct the modules opened my mind to how materials can be engineered from a different depth."

Kiet, MSI Student 2024

"MSI opened my eyes to how material behavior is modeled across scales and measured in real-time."

Dung, MSI Student 2024

"Disorientation bothers me sometime. MSI is where I reposition myself and unlock my potential"

Khanh, MSI Student 2024

"Materials Science and Engineering is fantastic because it shows me how the structure-property relation is practically used for the design of new materials, the creation of robust and innovative materials processing and manufacturing as well as enhanced materials performance."

Dr. Nguyen Xuan Thanh, MSI coordinator



CONTACT & EXTRA INFORMATION

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Admissions & Application Support

VGU Master's programs

Email: masterinfo@vgu.edu.vn

Hotline: +84 988 629 705

Apply online: <https://apply.vgu.edu.vn>

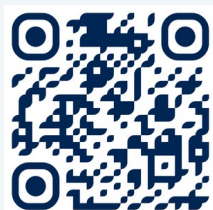
Application portal open: May – August

Vietnamese-German University (VGU)

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Website: www.vgu.edu.vn

MSI website



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