

## AMIS: M1 TUD HOME UNIVERSITY (first year students):

| AUTUMN SEMESTER              |  |           |          |
|------------------------------|--|-----------|----------|
| <b>Compulsory courses</b>    | Name   | ECTS      | Comments |
| 01-27-2M01/6                 | Venture Valuation *  | 6         | I&ENT    |
| 11-01-4191                   | Inno-Project Ia  | 3         | I&ENT    |
| 11-01-4104                   | Functional Materials   | 6         |          |
| 11-01-4105                   | Surfaces and Interfaces  | 5         |          |
| 11-01-4109                   | Micromechanics for Materials Science **                          | 6         |          |
| 11-01-4101                   | Research Lab I   | 4         | Lab work |
|                              | TOTAL  | <b>30</b> |          |
| SPRING SEMESTER              |  |           |          |
| <b>Compulsory course</b>     | Name   | ECTS      |          |
| 11-01-4107                   | Advanced Characterization Methods of Materials Science           | 6         |          |
| 11-01-4106                   | Theoretical Methods in Materials Science                         | 6         |          |
| 11-01-4199                   | Advanced Research Lab (7)***                                     | 7         | I&ENT    |
| 11-01-4002-ov                | Career Coaching  | 0         | I&ENT    |
| 11-01-4192                   | Inno-Project Ib  | 3         | I&ENT    |
| 11-01-4193                   | Summer Camp  | 3         | I&ENT    |
| <b>Elective courses ****</b> |  |           |          |
| 11-01-3029                   | Advanced Light Microscopy  | 4         |          |
| 11-01-8191                   | Ceramic Materials: Syntheses and Properties. Part I              | 4         |          |
| 11-01-8291                   | Density Functional Theory: A Practical Introduction              | 5         |          |
| 11-01-2025                   | Dislocations in Ceramics   | 4         |          |
| 11-01-7300                   | Electrochemistry in Energy Applications I:                       | 4         |          |
| 01-62-2G04                   | Entrepreneurship*  | 5         | I&ENT    |
| 01-27-2M03/6                 | Entrepreneurial Strategy, Management & Finance *                 | 6         | I&ENT    |
| 11-01-2005                   | Fundamentals and Technology of Solar Cells                       | 4         |          |
| 11-01-2008                   | Graphen and Carbon Nanotubes - from fundamentals to applications | 4         |          |
| 11-01-2024                   | Hysteresis in Magnetic Materials                                 | 4         |          |
| 11-01-2017                   | In-situ Transmission Electron Microscopy                         | 4         |          |
| 11-01-2031                   | Machine Learning for Materials Science                           | 6         |          |
| 11-01-2022                   | Materials chemistry in electrocatalysis for energy applications  | 4         |          |
| 11-01-7042                   | Materials research with energetic ion beams                      | 4         |          |
| 11-01-2004                   | Materials Science of Thin Films                                  | 4         |          |
| 11-01-7070                   | Micromechanics and Nanostructured Materials                      | 4         |          |
| 11-01-9812                   | Phase Transitions in Materials                                   | 4         |          |
| 11-01-3030                   | <i>Polymer Processing</i>  | 4         |          |
| 11-01-8411                   | Properties of Ferroelectric Materials                            | 4         |          |
| 11-01-2019                   | Quantum Materials: Theory, Numerics, and Applications            | 4         |          |
| 11-01-7060                   | Scanning probe microscopy in materials science                   | 4         |          |
| 11-01-9062                   | Scanning Transmission Electron Microscopy for Materials Science  | 4         |          |
| 11-01-2002                   | Spintronics  | 4         |          |
| 11-01-2021                   | Technology of Nanoobjects  | 4         |          |
| 11-01-2018                   | Tunable properties in nanomaterials                              | 4         |          |
|                              | TOTAL  | <b>30</b> |          |

\* The course “**Venture Valuation**” can be replaced by the course “**Entrepreneurship**” or “**Entrepreneurial Strategy, Management & Finance**”. You only have to pass one of these three “Business modules”

\*\* The Course “**Micromechanics for Materials Science**” can be replaced by the course “**Quantum Mechanics for Materials Science (6 ECTS)**”

\*\*\* The Course Advanced Research Lab (7) can be replaced by the course **Advanced Research Lab (8)** 11-01-4197 with **8 ECTS**

\*\*\*\* All eligible “**Elective courses**” are listed in “*elective courses M. Sc. Materials Science*” in the TUCaN system. Only the following courses cannot be chosen: “Materials Science for Renewable Energy Systems ” or “Advanced Research Lab”. Students without a bachelor degree in Materials Science or Physics can also use the course “Concepts in Materials Physics (6 ECTS)” on request.

° The module “**Discussion with Mentor**” is also compulsory

## AMIS: M2 TUD HOST UNIVERSITY (second year students)

| AUTUMN SEMESTER            |   |           |          |
|----------------------------|---|-----------|----------|
| Code                       | Name  | ECTS      | Comments |
| <b>Compulsory</b>          |   |           |          |
| 11-01-4109                 | Micromechanics for Materials Science *                          | 6         |          |
| 11-01-4101                 | Research Lab I  | 4         |          |
| 01-27-2M01/6               | Venture Valuation (incl. Inno Project II)                       | 6         | I&ENT    |
|                            | AMIS Winter School in Aalto                                     | 0         |          |
| <b>Elective courses **</b> |   |           |          |
| 11-01-7342                 | Ceramic Materials: Syntheses and Properties. Part II            | 4         |          |
| 11-01-2009                 | Concepts in Materials Physics                                   | 6         |          |
| 11-01-7562                 | Computational Material science                                  | 5         |          |
| 11-01-7301                 | Electrochemistry in Energy Applications II:                     | 4         |          |
| 11-01-8131                 | Engineering Microstructures - Processing, Char. and Application | 4         |          |
| 11-01-2027                 | Finite Element Simulation in Material Science                   | 4         |          |
| 11-01-9063                 | Focused Ion Beam Microscopy: Basics and Applications            | 4         |          |
| 11-01-8202                 | Fundamentals and Techniques of Modern Surface Science           | 4         |          |
| 11-01-2016                 | Interfaces - From wetting to friction                           | 4         |          |
| 11-01-4197                 | Advanced Research Lab (8)                                       | 8         |          |
| 11-01-7892                 | Introduction to Scanning Electron Microscopy                    | 1         |          |
| 13-K3-M020                 | Life cycle assessment of products and systems                   | 3         |          |
| 11-01-2001                 | Magnetism and Magnetic Materials                                | 4         |          |
| 11-01-7292                 | Materials Chemistry   | 4         |          |
| 11-01-3018                 | Mathematical Methods in Materials Science                       | 4         |          |
| 11-01-9332                 | Mechanical Properties of Ceramic Materials                      | 4         |          |
| 11-01-2006                 | Mechanical Properties of Metals                                 | 4         |          |
| 11-01-2028                 | Metastable Materials: Structure, Properties and Processing      | 4         |          |
| 11-01-7070                 | Micromechanics and Nanostructured Materials                     | 4         |          |
| 11-01-9090                 | Modern steels for automotive applications                       | 4         |          |
| 11-01-2026                 | Organic Functional Materials: From LCD to Molecular Circuits    | 4         |          |
| 11-01-3031                 | <i>Polymer Materials</i>  | 6         |          |
| 11-01-2023                 | Porous Ceramics for Energy-Related Applications                 | 4         |          |
| 11-01-4004                 | Quantum Mechanics for Materials Science                         | 6         |          |
| 11-01-8162                 | Semiconductor Interfaces  | 4         |          |
|                            |   |           |          |
|                            |   |           |          |
|                            |   |           |          |
|                            | TOTAL   | <b>30</b> |          |
| <b>SPRING SEMESTER</b>     |   |           |          |
|                            | THESIS  | <b>30</b> |          |

\* The Course "**Micromechanics for Materials Science**" can be replaced by the course "**Quantum Mechanics for Materials Science (6 ECTS)**"

\*\* All eligible "**Elective courses**" are listed in "**elective courses M. Sc. Materials Science**" in the TUCaN system. Only the following courses cannot be chosen: "Materials Engineering", "Materials Science for Renewable Energy Systems", "Functional Materials", "Surf aces and Interfaces" or "Advanced Research Lab". Students without a bachelor degree in Materials Science or Physics can also use the course "Concepts in Materials Physics (6 ECTS)" on request.

° The module "**Discussion with Mentor**" is voluntary but recommended