Chair of Space Technology
Technische Universität Berlin

MASTER OF SPACE ENGINEERING

MSE COURSE DELIVERY FORMATS AND ONLINE SUITABILITY

MSE
Master of Space Engineering

The Master of Space Engineering (MSE) programme is designed to support both students who study fully online and those who occasionally cannot attend live sessions.

Each course is structured individually to best reflect its content and the lecturer's teaching style. This means that delivery formats may vary, and course structures may be adjusted over time.

While most courses can be completed without attending live sessions, the learning experience differs: in-person participation fosters deeper understanding and provides valuable opportunities to interact directly with lecturers and peers.

For students studying online or asynchronously, support is always available. Each course on ISIS (TU Berlin's learning platform) provides forums for discussion, and lecturers can be contacted via email. Many are also open to arranging consultation sessions via Zoom upon request.

By offering hybrid learning formats, MSE is one of TU Berlin's most flexible and innovative study programs. If you wish to take electives outside the MSE program that are offered online, you can find them by applying filters under "Advanced Options" in the TU Berlin course catalogue.

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2 COURSE DELIVERY FORMATS OVERVIEW

Module	Credit Points	Teaching mode	Asynchronous study
A Space Technology			
Fundamentals of Space Technology	9	Online only	Yes
Satellite Technology	6	Hybrid[1]	Yes
Space Electronics	6	Hybrid[1]	Yes
Radiation Effects on Space Electronics	3	Hybrid[1]	Yes
Spacecraft Dynamics and Control	9	Hybrid[1]	Partial[2]
Spacecraft Propulsion Systems	6	Hybrid[1]	Partial[2]
Space Sensors and Instruments	6	Hybrid[1]	Yes
B Space System Design			
Space System Design Project	9	Hybrid[1]	Yes
Space Technology Project	9	Hybrid[1]	Yes
Planetary Exploration and Space Robotics 1	6	Hybrid[1]	Yes
Planetary Exploration and Space Robotics 2	6	Hybrid[1]	Yes
Space Engineering Focus Project	6	Hybrid[1]	Yes
C Space Operations			
Space Mission Planning and Operations	6	Hybrid[1]	Yes
Human Spaceflight	6	Hybrid[1]	Yes
Space Flight Mechanics	6	Hybrid[1]	Partial[2]
Introduction to Satellite Geodesy	6	Hybrid[1]	Yes
Satellite Communication	6	On campus only	No
D Interdisciplinary			
Project Management	6	On campus only	External[3]
Innovation Management and Entrepreneurship	6	On campus only	External[3]
Soft Skills	3	On campus only	External[3]
German for Engineers A1.1	3	On campus only	External[3]
German for Engineers A1.2	3	On campus only	External[3]
German for Engineers A2.1	3	On campus only	External[3]
German for Engineers A2.2	3	On campus only	External[3]
Voluntary Internship	6	Remote possible	Depends on the internship
Master thesis	30	Remote possible	Depends on the thesis

[1] Students can choose to participate either on campus or online.

[2] No recorded video lectures are available; however, all materials are provided for self-study.

[3] External coursework and certificates can be recognized for credit. In addition, dedicated alternative online courses are available.

3 MODULE GROUP A

FUNDAMENTALS OF SPACE TECHNOLOGY

Lectures: All lectures are available in video format (either pre-recorded or live recording). The MBSE exercise sessions in FST 2 are not recorded but the non-graded assignment can be solved individually.

Assignments: Graded digital assignments with deadlines are to be submitted through ISIS.

Examination: For the written exams, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

SATELLITE TECHNOLOGY

Lectures: All lectures are available in video format (either pre-recorded or live recording). The live sessions focus on questions and discussions about the video lectures and are not recorded.

Guest talks: Most guest lectures are recorded. Lectures by a few industry guest speakers may not be recorded due to company policy. The content is not relevant for the exam. All lecture slides of guest speakers are provided.

Assignments: Quizzes and assignments with deadlines are to be submitted through ISIS. The assignments only provide bonus points for the exam. Students need to select an assignment group on ISIS at the beginning of the semester.

Examination: For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

SPACE ELECTRONICS

Lectures: All lectures are available in video format (pre-recorded or live recording depending on the topic). The live sessions focus on building circuits in the classroom and are not recorded.

Assignments: Graded assignments with deadlines are to be submitted through ISIS. The electronics hardware kits will be sent to students at the beginning of each semester.

Project: The electronics project can be presented via Zoom. All students will be invited to select a day and time.

Examination: For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

RADIATION EFFECTS ON SPACE ELECTRONICS

Lectures: All lectures are available in video format (either pre-recorded or live recording depending on the topic). A visit to a radiation chamber in Berlin takes place in person, however, pictures and videos are available on ISIS to provide impressions.

Exercises: The simulation exercises can be solved individually with the support of the recorded lectures.

Examination: An open book written exam is held in parallel on campus and online.

SPACECRAFT DYNAMICS AND CONTROL

Lectures: Part 1: Pre-recorded video lectures are available. The live exercises are not recorded, but all tasks and solutions are provided on ISIS.

Part 2: The lectures and exercises are not recorded, and no pre-recording is available. All lecture slides, exercises and solutions are provided on ISIS. The lecturers encourage online students to reach out and schedule a consultation session.

Assignments: Part 1: Quizzes and assignments with deadlines are to be submitted through ISIS. The assignments only provide bonus points for the exam.

Part 2: No assignments.

Examination: For the written exam, online students will be invited to select a day and time for an equivalent oral exam in Zoom.

SPACECRAFT PROPULSION SYSTEMS

Lectures: Live lectures are not recorded. All lecture slides, exercises and solutions are provided on ISIS. Some chapters are offered in a flipped classroom format, including lecture videos and reading material.

Assignments: No graded assignments. In-class exercises for which solutions are provided.

Examination: An oral exam can be held via Zoom; students will be invited to select a day and time.

SPACE SENSORS AND INSTRUMENTS

Lectures: The theoretical lectures are streamed, recorded and uploaded. All lecture slides are provided on ISIS.

Project: Students participating online and asynchronously will be allocated to dedicated work packages, while individual consultation sessions will be arranged.

Examination: All students must present during the graded midterm and final presentations. The day and time can be agreed upon with the lecturer. All students must contribute to the graded documentation.

4 MODULE GROUP B

SPACE SYSTEM DESIGN PROJECT

Lectures: All lectures are available in video format (either pre-recorded or live recording). The live sessions focus on questions and discussions about the video lectures and are not recorded.

Project: Students are usually assigned to work packages with at least one or two other students. The weekly project sessions are not recorded. It is possible that students speak on behalf of their teammates. Thus, presence in the project sessions is not strictly necessary.

Examination: All students must present during the graded midterm and final presentations. The day and time can be agreed upon with the lecturer. Only under exceptional circumstances, a pre-recorded presentation is allowed. All students must contribute to the graded documentation. For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

SPACE TECHNOLOGY PROJECT

Lectures: No lectures, only project sessions.

Project: Students are usually assigned to work packages with at least one or two other students. The weekly project sessions are not recorded. It is possible that students speak on behalf of their teammates. Thus, presence in the project sessions is not strictly necessary.

Examination: All students must present during the graded midterm and final presentations. The day and time can be agreed upon with the lecturer. Only under exceptional circumstances, a pre-recorded presentation is allowed. All students must contribute to the graded documentation.

PLANETARY EXPLORATION AND SPACE ROBOTICS 1

Lectures: Most lectures are available in video format (either pre-recorded or live recording).

Project: The main robotics group project is very hardware-oriented. Students studying online receive a separate topic that is independent of the group project. They work on this individual topic at their own pace and schedule consultation sessions.

Examination: All students must present during the graded midterm and final presentations. The day and time can be agreed upon with the lecturer. Only under exceptional circumstances, a pre-recorded presentation is allowed. All students must contribute to the graded documentation.

PLANETARY EXPLORATION AND SPACE ROBOTICS 2

Lectures: No lectures, only project sessions.

Project: The main robotics group project is very hardware-oriented. Students studying online receive a separate topic that is independent of the group project. They work on this individual topic at their own pace and schedule consultation sessions.

Examination: All students must present during the graded midterm and final presentations. The day and time can be agreed upon with the lecturer. Only under exceptional circumstances, a pre-recorded presentation is allowed. All students must contribute to the graded documentation.

SPACE ENGINEERING FOCUS PROJECT

Lectures: No lectures, only project work.

Assignments: This module allows students to get credits for their extracurricular activities. Students register their project with the lecturer and agree on an individual schedule any time during the year.

Examination: Students must present their work in a graded presentation. The day and time can be agreed upon with the lecturer. Students must submit a graded documentation.

More information about the module Space Engineering Focus Project on the RFT Infopoint.

5 MODULE GROUP C

SPACE MISSION PLANNING AND OPERATIONS

Lectures: All lectures are available in video format (either pre-recorded or live recording). The live sessions focus on questions and discussions about the video lectures and are not recorded.

Project: Students can work on the satellite mission design project at their own pace.

Examination: Students must present their work in a graded presentation. The day and time can be agreed upon with the lecturer. For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

HUMAN SPACEFLIGHT

Lectures: Part "Technical Aspects": All lectures are recorded.

Part "Space Psychology": All lectures are recorded.

Project: Part "Technical Aspects": Students can work on the human space mission design project at their own pace.

Examination: Part "Technical Aspects": Students must present their work in a graded presentation. The day and time can be agreed upon with the lecturer. Students must submit a graded documentation.

Part "Space Psychology": For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

SPACE FLIGHT MECHANICS

Lectures: The lectures and exercises are not recorded, and no pre-recording is available. All lecture slides, exercises and solutions are provided on ISIS. The lecturers encourage online students to reach out and schedule a consultation session.

Assignments: No graded assignments. In-class exercises for which solutions are provided.

Examination: For the written exam, online students will be invited to select a day and time for an equivalent oral exam via Zoom.

INTRODUCTION TO SATELLITE GEODESY

Lectures: All Lectures are available in video format (either pre-recorded or live recording). The live sessions focus on questions and discussions about the video lectures and are not recorded.

Assignments: Regular assignments are to be submitted in small groups on ISIS.

Examination: An oral exam can be held via Zoom; students will be invited to select a day and time.

SATELLITE COMMUNICATION

The course is offered on campus only.

6 MODULE GROUP D

PROJECT MANAGEMENT

The course is offered on campus only.

As an alternative to taking the course, it is possible to have an external asynchronous online course recognized. Please read the information on the RFT Infopoint or contact the MSE office.

INNOVATION MANAGEMENT AND ENTREPRENEURSHIP

The course is offered on campus only.

As an alternative to taking the course, it is possible to have an external asynchronous online course recognized. Please read the information on the RFT Infopoint or contact the MSE office.

SOFT SKILLS

The course is offered on campus only.

As an alternative to taking the course, it is possible to have an external asynchronous online course recognized. Please read the information on the RFT Infopoint or contact the MSE office.

GERMAN FOR ENGINEERS (A1.1, A1.2, A2.1 & A2.2)

The courses are offered on campus only.

It is possible to recognize external German courses offered by certain institutions. Please read the information on the RFT Infopoint or contact the MSE office.

VOLUNTARY INTERNSHIP

Students can get credits for internships and work placements during their study period in MSE. The internship must have a minimum duration of 180 hours. The internship may last longer, but recognition of more than 6 credit points is not possible. More details about the internship can be found on the RFT Infopoint.

MASTER THESIS

The thesis can be prepared from any location and is generally well-suited for online studies or studying while working. More information about preparing for the thesis can be found on the RFT Infopoint.

Chair of Space Technology

Technische Universität Berlin

Marchstraße 12-14, Room 409
10587 Berlin, Germany

mse.tu-berlin.de
info@mse.tu-berlin.de
+49 30 314 25 922