Julius-Maximilians-
UNIVERSITÄT
WÜRZBURG

# Module Catalogue

for the Module studies (Bachelor)

# Aerospace Computer Science

Examination regulations version: 2021
Responsible: Faculty of Mathematics and Computer Science
Responsible: Institute of Computer Science

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# The subject is divided into


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# Abbreviations used

Course types: **E** = field trip, **K** = colloquium, **O** = conversatorium, **P** = placement/lab course, **R** = project, **S** = seminar, **T** = tutorial, **Ü** = exercise, **V** = lecture

Term: **SS** = summer semester, **WS** = winter semester

Methods of grading: **NUM** = numerical grade, **B/NB** = (not) successfully completed

Regulations: **(L)ASPO** = general academic and examination regulations (for teaching-degree programmes), **FSB** = subject-specific provisions, **SFB** = list of modules

Other: **A** = thesis, **LV** = course(s), **PL** = assessment(s), **TN** = participants, **VL** = prerequisite(s)

# Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

# Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

# In accordance with

the general regulations governing the degree subject described in this module catalogue:

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

**15-May-2019 (2019-36)**

**27-Jun-2019 (2019-41)**

**14-Nov-2019 (2019-52)**

**22-Jan-2020 (2020-13)**

**06-May-2020 (2020-39)**

**22-Jul-2020 (2020-57)**

**17-Dec-2020 (2020-110)**

**10-Mar-2021 (2021-17)**

**09-Jun-2021 (2021-58)**

**22-Dec-2021 (2021-85)**

**05-Jul-2022 (2022-52)**

**31-Jan-2023 (2022-86)**

**15-Jun-2023 (2023-58)**

**13-Dec-2023 (2023-107)**

**07-Aug-2024 (2024-82)**

**22-Jan-2025 (2025-1)**

**09-Jul-2025 (2025-75)**

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.

## Summer Term 2021

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

## Winter Term 2021

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
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| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
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| **Module coordinator** | | **Module offered by** | |
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| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

## Summer Term 2022

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

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**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
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| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

## Winter Term 2022

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

## Summer Term 2023

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

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**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

## Winter Term 2023

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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## Summer Term 2024

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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## Winter Term 2024

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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## Summer Term 2025

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 6 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

180 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-172-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 4 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

120 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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# Winter Term 2025

(o ECTS credits)

| Module title | | | Abbreviation |
|---|---|---|---|
| **Aerospace Laboratory** | | | 10-I-LRLA-252-m01 |
| **Module coordinator** | | **Module offered by** | |
| holder of the Chair of Computer Science VIII | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 5 | numerical grade | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Structure and control of satellites and airplanes, control and (very little) regulation of physical/mechanical systems, sensors and actuators, energy, structure (construction) of a satellite model/simulator, construction of a ground segment for different components and systems of air and space flight, structure of simplified subsystems of air and space flight. Life cycle of a complex development consisting of software, hardware, electronics and mechanics. Selection of suitable components.

**Intended learning outcomes**

The students will be able to construct and integrate prototypical subsystems consisting of software, hardware, electronics and mechanics by themselves as well as to operate, test and document these. The whole life cycle of a development will be tested: capture of requirements, rudimentary design, detailed design, modelling, implementation (software, hardware, mechanics), test design, inspection, maintenance, transfer to the successor model.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Completion of approx. 6 practical exercises (approx. 4 hours each)

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical Measurement and Control System Engineering** | | | 10-I-HMR-152-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 8 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Practical experiments of control aspects (hardware and software), for example implementation of linear and non-linear controllers in robotics or aerospace information technology.

**Intended learning outcomes**

Students understand closed loop systems and are able to implement and set controllers.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (6)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project with presentation (approx. 15 minutes) and written elaboration (approx. 12 to 15 pages)

**Allocation of places**

--

**Additional information**

--

**Workload**

240 h

**Teaching cycle**

Teaching cycle: every semester

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--

| Module title | | | Abbreviation |
|---|---|---|---|
| **Practical work Space Technology** | | | 10-I-PLR-252-m01 |
| **Module coordinator** | | **Module offered by** | |
| Dean of Studies Informatik (Computer Science) | | Institute of Computer Science | |
| **ECTS** | **Method of grading** | **Only after succ. compl. of module(s)** | |
| 5 | (not) successfully completed | -- | |
| **Duration** | **Module level** | **Other prerequisites** | |
| 1 semester | undergraduate | -- | |

**Contents**

Completion of a practical task.

**Intended learning outcomes**

The practical allows participants to work on a problem in space information technology in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

report (5 to 10 pages) and presentation (approx. 15 minutes) on practical work

**Allocation of places**

--

**Additional information**

--

**Workload**

150 h

**Teaching cycle**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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