

## Subdivided Module Catalogue for the Subject

# **Computer Science**

as a Master's with 1 major with the degree "Master of Science" (120 ECTS credits)

Examination regulations version: 2018 Responsible: Faculty of Mathematics and Computer Science Responsible: Institute of Computer Science

JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record 88|079|-|-|H|2018



## **Learning Outcomes**

German contents and learning outcome available but not translated yet.

#### Wissenschaftliche Befähigung

- Die Absolventinnen und Absolventen können erweiterte mathematische, technische, theoretische und praktische Konzepte der Informatik anwenden.
- Die Absolventinnen und Absolventen können tiefergehende Kenntnisse in mindestens einem Teilgebiet abrufen.
- Die Absolventinnen und Absolventen können fortgeschrittene hard- und/oder softwaregetriebene Experimente durchführen, analysieren, auswerten und die erhaltenen Ergebnisse darstellen.
- Die Absolventinnen und Absolventen sind in der Lage, sich mit Hilfe von Fachliteratur in neue Aufgabengebiete einzuarbeiten und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen besitzen Abstraktionsvermögen, analytisches Denken, Problemlösungskompetenz und die Fähigkeit, fortgeschrittene Zusammenhänge zu strukturieren.
- Die Absolventinnen und Absolventen sind in der Lage, fortgeschrittene Methoden der Informatik auf konkrete praktische oder theoretische Aufgabenstellungen anzuwenden, Lösungswege zu entwickeln und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen setzen die erlernten theoretischen und praktischen Methoden in geschlossener Form ein, um zu zeigen, dass sie zur Anwendung der Konzepte wissenschaftlichen Arbeitens befähigt sind.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

#### Befähigung zur Aufnahme einer Erwerbstätigkeit

- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.
- Die Absolventinnen und Absolventen sind in der Lage, konstruktiv und zielorientiert in einem Team zusammenzuarbeiten und auftretende Konflikte zu lösen (Teamfähigkeit).
- Die Absolventinnen und Absolventen können ihre erworbenen Kompetenzen in unterschiedlichen interkulturellen Kontexten und in international zusammengesetzten Teams anwenden.
- Die Absolventinnen und Absolventen kennen wichtige Anforderungen und Arbeitsweisen im gewerblichen Umfeld sowie in Forschung und Entwicklung.
- Die Absolventinnen und Absolventen sind befähigt, Probleme zu analysieren und zu lösen und sich in weniger vertraute Themenkomplexe einzuarbeiten.

#### Persönlichkeitsentwicklung

- Eigenverantwortlichkeit, Selbstständigkeit, Zeitmanagement, Teamfähigkeit
- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und beachten sie.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

#### Befähigung zum gesellschaftlichen Engagement

- Die Absolventinnen und Absolventen können Entwicklungen im Informationssektor kritisch reflektieren und deren Auswirkungen auf die Wirtschaft, Gesellschaft und die Umwelt in Ansätzen erfassen (Technikfolgenabschätzung).
- Die Absolventinnen und Absolventen haben ihr Wissen bezüglich wirtschaftlicher, gesellschaftlicher, kultureller etc. Fragestellungen erweitert und können in Ansätzen begründet Position beziehen.
- Die Absolventinnen und Absolventen entwickeln die Bereitschaft und Fähigkeit, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.

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|   | reg. data record Master (120 ECTS) Informatik - 2018 |              |

## Abbreviations used

Course types:  $\mathbf{E}$  = field trip,  $\mathbf{K}$  = colloquium,  $\mathbf{O}$  = conversatorium,  $\mathbf{P}$  = placement/lab course,  $\mathbf{R}$  = project,  $\mathbf{S}$  = seminar,  $\mathbf{T}$  = tutorial,  $\ddot{\mathbf{U}}$  = exercise,  $\mathbf{V}$  = 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:

#### ASPO2015

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

#### 14-Mar-2018 (2018-15)

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.

## The subject is divided into

| Abbreviation             |  | Module title                               | ECTS<br>credits | Method of grading | page      |
|--------------------------|--|--|-----------------|-------------------|-----------|
| Compulsory Courses (20 E | CTS credits)   |  |                 |                   |           |
| 10-I=SEM3-161-m01        | Seminar 1 -  | Current Topics in Computer Science         | 5               | NUM               | 115       |
| 10-I=SEM4-161-m01        | 10-I=SEM4-161-mo1 Seminar 2 - Current Topics in Computer Science |  |                 | NUM               | 116       |
| 10-I=PRAK-161-m01        | Practical co   | ourse - Current Topics in Computer Science | 10              | B/NB              | 101       |
| Compulsory Electives (70 | ECTS credits   | )  |                 |                   |           |
| General Compulsory Elec  | tives (50 EC   | TS credits)                                |                 |                   |           |
| 10-l=3D-161-m01          | 3D Point Cl  | oud Processing                             | 5               | NUM               | 17        |
| 10-l=BS-161-m01          | Operating S  | Systems                                    | 5               | NUM               | 50        |
| 10-I=DM-161-m01          | Data Minin   | g  | 5               | NUM               | 56        |
| 10-I=DB-161-m01          | Databases  |  | 5               | NUM               | 53        |
| 10-l=DB2-161-m01         | Databases  | 2  | 5               | NUM               | 54        |
| 10-l=lCG-161-m01         | Interactive  | Computer Graphics                          | 5               | NUM               | 74        |
| 10-l=KT-161-m01          | Computatio   | onal Complexity                            | 5               | NUM               | 83        |
| 10-l=KD-161-m01          | Cryptograp   | hy and Data Security                       | 5               | NUM               | 78        |
| 10-l=APR-161-m01         | Advanced F   | Programming                                | 5               | NUM               | 42        |
| 10-l=SSS-172-m01         | Security of  | Software Systems                           | 5               | NUM               | 118       |
| 10-l=RAK-161-m01         | Computer A   | Architecture                               | 5               | NUM               | 104       |
| 10-l=RK-161-m01          | Computer N   | letworks and Communication Systems         | 8               | NUM               | 107       |
| 10-l=WBS-161-m01         | Knowledge  | -based Systems                             | 5               | NUM               | 126       |
| 10-I=PRJAK-162-m01       | Project - Cu   | rrent Topics in Computer Science           | 5               | NUM               | 102       |
| 10-l=AA-152-m01          | Advanced A   | Automation                                 | 8               | NUM               | 18        |
| 10-l=AGIS-161-m01        | Algorithms   | for Geographic Information Systems         | 5               | NUM               | 24        |
| 10-l=AG-161-m01          | Computatio   | onal Geometry                              | 5               | NUM               | 20        |
| 10-I=APA-161-m01         | Approxima  | tion Algorithms                            | 5               | NUM               | 40        |
| 10-I=AUT-161-m01         | Automata T   | heory                                      | 5               | NUM               | 44        |
| 10-l=AVS-161-m01         | Avionics Sy  | rstems                                     | 5               | NUM               | 46        |
| 10-HCI=MMUI-161-m01      |  | User Interfaces                            | 5               | NUM               | 13        |
| 10-l=BER-161-m01         | Computabi  | lity Theory                                | 5               | NUM               | 48        |
| 07-BI-161-m01            | Bioinforma   |  | 5               | NUM               | 7         |
| 10-l=CB-161-m01          | Compiler C   | onstruction                                | 5               | NUM               | 51        |
| 10-l=DDB-172-m01         | Deductive I  | Databases                                  | 5               | NUM               | 55        |
| 10-l=LP-172-m01          | Logic Progr  | amming                                     | 5               | NUM               | 85        |
| 10-l=EL-161-m01          | E-Learning   |  | 5               | NUM               | 57        |
| 10-I=PNN-182-m01         | -  | ng with neural nets                        | 5               | NUM               | 100       |
| 10-l=NLP-182-m01         |  | arning for Natural Language Processing     | 5               | NUM               | 92        |
| 10-l=HCl-161-m01         | Introductio  | n into Human-Computer Interaction          | 5               | NUM               | 72        |
| 10-l=ES-161-m01          |  | Embedded Systems                           |                 | NUM               | 60        |
| 10-I=PA-161-m01          |  | d Design of Programs                       | 5               | NUM               | 93        |
| 10-I=IR-161-m01          | Information Retrieval  |  | 5               | NUM               | 76        |
| 10-HCI=3DUI-161-m01      | 3D User Interfaces   |  | 5               | NUM               | 9         |
| 10-l=KT2-161-m01         | -  | onal Complexity II                         | 5               | NUM               | 84        |
| 10-l=Kl1-161-m01         | Artificial Int   |  | 5               | NUM               | 79        |
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| 10-l=Kl2-161-m01                     | Artificial Intelligence 2  | 5  | NUM  | 81       |
|--------------------------------------|--|----|------|----------|
| 10-I=LVS-161-m01                     | Performance Evaluation of Distributed Systems  | 8  | NUM  | 86       |
| 10-I=ML-161-m01                      | Mathematical Logic   | 5  | NUM  | 90       |
| 10-I=MI-161-m01                      | Medical Informatics  | 5  | NUM  | 88       |
| 10-I=PEB-161-m01                     | Performance Engineering & Benchmarking of Computer Sy-<br>stems  | 5  | NUM  | 95       |
| 10-I=PM-182-m01                      | Professional Project Management  | 5  | NUM  | 98       |
| 10-I=RAM-161-m01                     | Computer Arithmetic  | 5  | NUM  | 105      |
| 10-l=R01-182-m01                     | Robotics 1   | 8  | NUM  | 109      |
| 10-I=RO2-152-m01                     | Robotics 2   | 8  | NUM  | 110      |
| 10-l=ST-161-m01                      | Discrete Event Simulation  | 8  | NUM  | 120      |
| 10-HCI=RIS-182-m01                   | Real-Time Interactive Systems  | 5  | NUM  | 15       |
| 10-I=SAR-161-m01                     | Software Architecture  | 5  | NUM  | 113      |
| 10-l=SSD-152-m01                     | Spacecraft System Design   | 8  | NUM  | 117      |
| 10-HCI=MLUI-161-m01                  | Machine Learning (for User Interfaces)   | 5  | NUM  | 11       |
| 10-I=PI-172-m01                      | Probabilistic Inference  | 5  | NUM  | 97       |
| 10-l=VG-161-m01                      | Visualization of Graphs  | 5  | NUM  | 124      |
| 10-I=AGE-191-m01                     | Selected Topics of Games Engineering   | 5  | NUM  | 23       |
| 10-I=AKA-161-m01                     | Selected Topics in Algorithms  | 5  | NUM  | 26       |
| 10-I=AKT-161-m01                     | Selected Topics in Theory  | 5  | NUM  | 38       |
| 10-I=AKSE-161-mo1                    | Selected Topics in Software Engineering  | 5  | NUM  | 37       |
| 10-I=AKITS-172-m01                   | Selected Topics in IT Security   | 5  | NUM  | 34       |
| 10-I=AKIT-161-m01                    | Selected Topics in Internet Technologies   | 5  | NUM  | 32       |
| 10-I=AKIS-161-m01                    | Selected Topics in Intelligent Systems   | 5  | NUM  | 31       |
| 10-I=AKES-161-m01                    | Selected Topics in Embedded Systems  | 5  | NUM  | 28       |
| 10-I=STM-162-m01                     | NLP and Text Mining  | 5  | NUM  | 122      |
| 10-I=AKLR-161-m01                    | Selected Topics in Aerospace Engineering   |    | NUM  |          |
| 10-I=AKHCI-182-mo1                   | Selected Topics in HCI   | 5  | NUM  | 35       |
| 10-I=AKII-182-m01                    | Selected Topics in Computer Science  | 5  | NUM  | 29       |
| Projects and Tarining                |  | 5  | NOM  | 30       |
| 10-I=RSE-182-m01                     | Space Systems Design   | 10 | NUM  | 112      |
| 10-I=EPB-182-m01                     | Design of Planetary Bases and Orbital Stations   | 10 | NUM  |          |
| 10-I=PRT-182-m01                     | Practical course - Rocket Engineering and Payloads   |    | B/NB | 59       |
| 10-I=FZB-182-m01                     | Aircraft Construction  | 10 | NUM  | 103      |
| 10-I=FSIM-182-m01                    | Flight Simulator   | 10 | NUM  | 63<br>62 |
| 10-I=GRLT-182-m01                    | Game Research Lab - Theory   | 10 |      |          |
|                                      |  | 10 | NUM  | 70       |
| 10-I=GRAR-182-m01                    | Game Research Lab - Architectures  | 10 | NUM  | 66       |
| 10-I=GRDE-182-mo1                    | Game Research Lab - Design   | 10 | NUM  | 68       |
| 10-I=GRAP-182-m01                    | Game Research Lab - Applications   | 10 | NUM  | 64       |
| 10-I-PAT1-182-m01                    | Practical Course - Algorithms and Theory 1   | 10 | NUM  | 129      |
| 10-I-PAT2-182-m01                    | Practical Course - Algorithms and Theory 2   | 10 | NUM  | 130      |
| 10-I-PSE1-182-m01                    | Practical Course - Software Engineering 1  | 10 | NUM  | 139      |
| 10-I-PSE2-182-m01                    | Practical Course - Software Engineering 2  | 10 | NUM  | 140      |
| 10-I-PIT1-182-m01                    | Practical Course - Internet Technology 1   | 10 | NUM  | 137      |
| 10-I-PIT2-182-m01                    | Practical Course - Internet Technology 2   | 10 | NUM  | 138      |
| 10-I-PIS1-182-m01                    | Practical Course - Intelligent Systems 1   | 10 | NUM  | 135      |
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| 10-I-PIS2-182-m01        | Practical Course - Intelligent Systems 2                  | 10 | NUM  | 136 |  |  |  |
|--------------------------|---|----|------|-----|--|--|--|
| 10-I-PES1-182-m01        | Practical Course - Embedded Systems 1                     | 10 | NUM  | 131 |  |  |  |
| 10-I-PES2-182-m01        | Practical Course - Embedded Systems 2                     | 10 | NUM  | 132 |  |  |  |
| 10-I-PHCl1-182-m01       | Practical Course - Human Computer Interaction 1           | 10 | NUM  | 133 |  |  |  |
| 10-I-PHCl2-182-m01       | Practical Course - Human Computer Interaction 2           | 10 | NUM  | 134 |  |  |  |
| 10-I=AGE-182-m01         | Selected Topics of Games Engineering                      | 5  | NUM  | 22  |  |  |  |
| 10-I=AKA-161-m01         | Selected Topics in Algorithms                             | 5  | NUM  | 26  |  |  |  |
| 10-I=AKT-161-m01         | Selected Topics in Theory                                 | 5  | NUM  | 38  |  |  |  |
| 10-I=AKSE-161-m01        | Selected Topics in Software Engineering                   | 5  | NUM  | 37  |  |  |  |
| 10-I=AKITS-172-m01       | Selected Topics in IT Security                            | 5  | NUM  | 34  |  |  |  |
| 10-I=AKIT-161-m01        | Selected Topics in Internet Technologies                  | 5  | NUM  | 32  |  |  |  |
| 10-I=AKIS-161-m01        | Selected Topics in Intelligent Systems                    | 5  | NUM  | 31  |  |  |  |
| 10-I=AKES-161-m01        | Selected Topics in Embedded Systems                       | 5  | NUM  | 28  |  |  |  |
| 10-I=STM-162-m01         | NLP and Text Mining                                       | 5  | NUM  | 122 |  |  |  |
| 10-I=AKLR-161-m01        | Selected Topics in Aerospace Engineering                  | 5  | NUM  | 35  |  |  |  |
| Thesis (30 ECTS credits) | Thesis (30 ECTS credits)                                  |    |      |     |  |  |  |
| 10-I-MA-MK-182-m01       | 10-I-MA-MK-182-mo1 Concluding Colloquium Computer Science |    | B/NB | 128 |  |  |  |
| 10-I-MA-161-m01          | Master's Thesis Computer Science                          | 25 | NUM  | 127 |  |  |  |

| Module title  |           |  |                       | Abbreviation  |                       |              |
|---|-----------|--|-----------------------|---|-----------------------|--------------|
| Bioinfo   | ormatic   | 5  |                       |   | 07-BI-161-m01         |              |
| Modul   | e coord   | inator   |                       | Module offered by   |                       |              |
| holder  | of the (  | Chair of Bioinformatics                                      |                       | Faculty of Biology  |                       |              |
| ECTS  |           | od of grading  | Only after succ. con  | · · · · · ·   |                       |              |
| 5 numerical grade   |           |  |                       |   |                       |              |
| Duratio   |           | Module level   | Other prerequisites   |   |                       |              |
| 1 seme  |           | undergraduate  |                       |   |                       |              |
| Conter  | nts       |  |                       |   |                       |              |
| Fundamental principles of bioinformatics.   |           |  |                       |   |                       |              |
| Intend  | ed leari  | ning outcomes  |                       |   |                       |              |
|   |           | proficient in methods for                                    | the analysis of DNA a | und protein database  | 20                    |              |
|   |           |  | · ·                   | •   |                       |              |
|   |           | , number of weekly conta                                     | ct nours, language –  | - if other than Germa   | n)                    |              |
| V (2) +   |           |  |                       |   |                       |              |
|   |           | s <b>essment</b> (type, scope, la<br>on on whether module ca |                       |   | tion offered — if not | every seme-  |
|   |           | nation (approx. 60 to 120                                    |                       |   |                       |              |
|   |           | by the lecturer at the beg                                   |                       | the written examina   | tion may be replace   | d by an oral |
|   |           | f one candidate each (ap                                     |                       |   |                       |              |
|   |           | es per candidate).   |                       |   | <b>.</b> .            |              |
|   |           | ssessment: German and,                                       | /or English           |   |                       |              |
|   | ble for   |  |                       |   |                       |              |
| Allocat   | tion of p | DIaces   |                       |   |                       |              |
| Additid   | onal inf  | ormation   |                       |   |                       |              |
|   |           |  |                       |   |                       |              |
| Worklo  | bad       |  | ,                     |   |                       |              |
| 150 h   |           |  |                       |   |                       |              |
| -   | ng cycl   | 9  |                       |   |                       |              |
|   |           |  |                       |   |                       |              |
| Referre   | ed to in  | LPOI (examination regu                                       | lations for teaching- | degree programmes)  |                       |              |
|   |           |  | 0                     |   |                       |              |
| Modul   | e appea   | irs in   |                       |   |                       |              |
|   |           | ee (1 major) Computer Sc                                     | ience (2016)          |   |                       |              |
|   | -         | ee (1 major) Mathematics                                     |                       |   |                       |              |
|   | -         | ee (1 major) Computation                                     |                       | 6)  |                       |              |
|   | -         | ee (1 major) Computer Sc                                     |                       | 0)  |                       |              |
|   | -         |  |                       |   |                       |              |
| Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019) |           |  |                       |   |                       |              |
| Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019)      |           |  |                       |   |                       |              |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)              |           |  |                       |   |                       |              |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)                            |           |  |                       |   |                       |              |
| Master's degree (1 major) Computational Mathematics (2022)  |           |  |                       |   |                       |              |
| Master's degree (1 major) Computational Mathematics (2022)<br>Master's degree (1 major) Mathematics (2022)      |           |  |                       |   |                       |              |
|   | -         | ee (1 major) Computation                                     |                       | <u>(</u> )  |                       |              |
|   | -         | ee (1 major) Mathematics                                     |                       | יד  |                       |              |
|   |           | ning degree Gymnasium I                                      |                       | ion PLUS, Elite Netwo   | ork Bavaria (ENB) (2  | 025)         |
|   |           | Computer Science (2018)                                      | JMU Würzbı            | Irg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa | exam.                 | page 7 / 140 |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

| Module title   |   |  |  | Abbreviation   |  |  |
|--|---|--|--|--|--|--|
| 3D Use   | er Interf   | aces   |  |  | 10-HCI=3DUI-161-m                            | 01   |
| Module   | e coord   | inator   |  | Module offered by  |  |  |
| holder   | of the C  | Chair of Computer Scie   | nce IX   | Institute of Comput  | er Science                                   |  |
| ECTS   | 1   | od of grading  | Only after succ. con   | npl. of module(s)  |  |  |
| 5  | nume  | rical grade  |  |  |  |  |
| Duratio  | on  | Module level   | Other prerequisites  | i  |  |  |
| 1 seme   | ster  | graduate   |  |  |  |  |
| Conten   | lts   |  |  |  |  |  |
| lopmen<br>to learn<br>ques. I<br>on, the<br>tegratin<br>practic<br>deo. Pr<br>betwee<br>and htt<br>Intende<br>After th<br>spatial<br>spatial<br>put dev<br>V (2) +<br>Methor<br>ster, in | nt using<br>n and p<br>Design g<br>course<br>ng 3DUI<br>al proje<br>revious<br>en each<br>tps://w<br>ed learn<br>ne course<br>interfa<br>interfa<br>vices (e<br>s (type,<br>Ü (2)<br>d of ass | Virtual, Augmented or<br>ractice the skills essen<br>guidelines as well as cl<br>will address novel res<br>s with mobile devices,<br>ct (team work), which<br>years, the assignment<br>other to find the best<br>ww.youtube.com/watch<br>ing outcomes<br>se, the students will ga<br>ces. They will have a bu<br>ces, as well as evaluat<br>.g, motion tracking sys<br>number of weekly con<br>essment (type, scope,<br>on on whether module | in a solid background o<br>oad understanding of<br>ng then. Students will<br>tem and Head-mounte<br>tact hours, language –<br>language — if other the<br>can be chosen to earn | ogies. The module co<br>mplementation of his<br>3D Interaction techn<br>3D interaction for lar<br>ronment. Students w<br>m, a presentation, a<br>JI Contest 2011, whe<br>https://www.youtub<br>on the theory and the<br>the particular difficul<br>also learn about trace<br>d Display).<br>- if other than German<br>an German, examina | e methods to create<br>litional and novel 3D | dedicated<br>ction techni-<br>d. In additi-<br>nes; and in-<br>ugh a group<br>ges) and a vi-<br>s competed<br>s-pBW7Agc<br>your own 3D<br>d developing<br>) input/out- |
| Langua   |   | of project results (appro<br>ssessment: German ar<br>bonus   | -  |  |  |  |
| Allocat  | ion of p  | olaces   |  |  |  |  |
|  |   |  |  |  |  |  |
| Additio  | onal info   | ormation   |  |  |  |  |
| Focuse<br>HCI,GE   |   | able for students of the   | Master's programme I   | nformatik (Computer  | Science, 120 ECTS (                          | credits):  |
| Worklo   | ad  |  |  |  |  |  |
| 150 h  |   |  |  |  |  |  |
| Teaching cycle   |   |  |  |  |  |  |
|  |   |  |  |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |   |  |  |  |  |  |
| § 22 ll Nr. 3 b)   |   |  |  |  |  |  |
| Module appears in  |   |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2016)  |   |  |  |  |  |  |
| Master's degree (1 major) Mathematics (2016)   |   |  |  |  |  |  |
| Master's degree (1 major) Computational Mathematics (2016)   |   |  |  |  |  |  |
|  | -   | ee (1 major) Computer  |  |  |  |  |
|  |   | ee (1 major) Computer  |  |  |  | · · · · · ·  |
| Master's w   | ith 1 major   | Computer Science (2018)  |  | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa  |  | page 9 / 140   |

Master's degree (1 major) Computational Mathematics (2019) Master's degree (1 major) Mathematics (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Mathematics (2024) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Computer Science (2025)

| Module title   |   |   |   |                       | Abbreviation   |  |
|--|---|---|---|-----------------------|--|--|
| Machi  | Machine Learning (for User Interfaces) 10-HCI=MLUI-161-m01  |   |   |                       |  |  |
| Module coordinator   |   |   |   | Module offered by     |  |  |
| holder   | of the  | Chair of Computer Scienc                                    | e IX  | Institute of Comput   | er Science   |  |
| ECTS   | Meth  | od of grading   | Only after succ. con                            | npl. of module(s)     |  |  |
| 5  | nume  | rical grade   |   |                       |  |  |
| Durati   | on  | Module level  | Other prerequisites                             |                       |  |  |
| 1 seme   | ester   | graduate  |   |                       |  |  |
| Conter   | nts   |   |   |                       |  |  |
| cade, n<br>vastly<br>ly use<br>all area<br>gesture<br>wards<br>In this<br>plemen<br>but als<br>Finally<br>and AI<br>This co<br>Topics<br>nels, n<br>deep lo<br>learnin<br>how to | Machine learning is the science of getting computers to act without being explicitly programmed. In the past de-<br>cade, machine learning has given us practical speech recognition, effective web search, self-driving cars, and a<br>vastly improved understanding of the human genome. Machine learning is so pervasive today that you probab-<br>ly use it dozens of times a day without knowing it. It is one of today's prominent paradigms in HCI applicable in<br>all areas where the understanding of user input of high variability, specifically for natural interactions using, e.g.,<br>gesture, speech, or eye-gaze, is paramount. Many researchers also think it is the best way to make progress to-<br>wards human-level Al.<br>In this course, students will learn about the most effective machine learning techniques, and gain practice im-<br>plementing them and getting them to work. Students not only learn the theoretical underpinnings of learning,<br>but also gain the practical know-how needed to quickly and powerfully apply these techniques to new problems.<br>Finally, they learn about some of Silicon Valley's best practices in innovation as it pertains to machine learning<br>and Al.<br>This course provides a broad introduction to machine learning, data-mining, and statistical pattern recognition.<br>Topics include: (i) Supervised learning (parametric/non-parametric algorithms, support vector machines, ker-<br>nels, neural networks). (ii) Unsupervised learning (clustering, dimensionality reduction, recommender systems,<br>deep learning). (iii) Best practices in machine learning (bias/variance theory; innovation process in machine<br>learning and Al). The course will also draw from numerous case studies and applications, so that you'll also learn<br>how to apply learning algorithms to building gesture-based and multimodal interfaces, text and speech under-<br>standing (web search, anti-spam), smart robots (perception, control), computer vision, medical informatics, au- |   |   |                       |  |  |
|  |   | ning outcomes   |   |                       |  |  |
| After ti<br>gies, e<br>Studer  | ne cour<br>.g., like<br>nts will  | se, the students will be a<br>Octave. In addition, they     | / will be able to deriv<br>propriate approach a | e main principles an  | eir own using assistive technolo-<br>d apply these in own programs.<br>iven machine learning task in va- |  |
| Course   | <b>es</b> (type   | , number of weekly conta                                    | act hours, language –                           | - if other than Germa | n)   |  |
| V (2) +  | Ü (2)   |   |   |                       |  |  |
|  |   | <b>sessment</b> (type, scope, la<br>ion on whether module c |   |                       | tion offered — if not every seme-  |  |
| Langua   | presentation of project results (approx. 40 minutes)<br>Language of assessment: German and/or English<br>creditable for bonus   |   |   |                       |  |  |
| Allocation of places   |   |   |   |                       |  |  |
|  |   |   |   |                       |  |  |
| Additio  | onal inf  | ormation  |   |                       |  |  |
| Focuse<br>HCI,GE   |   | able for students of the M                                  | Aaster's programme I                            | nformatik (Computer   | Science, 120 ECTS credits):  |  |
| Worklo   |   |   |   |                       |  |  |
| 150 h  |   |   |   |                       |  |  |

#### Teaching cycle

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

| § 22 | 11 | Nr. | 3 | b) |  |
|------|----|-----|---|----|--|
|      |    |     |   |    |  |

| Module appears in  |
|--|
| Master's degree (1 major) Computer Science (2016)  |
| Master's degree (1 major) Mathematics (2016)   |
| Master's degree (1 major) Computational Mathematics (2016)   |
| Master's degree (1 major) Computer Science (2017)  |
| Master's degree (1 major) Computer Science (2018)  |
| Master's degree (1 major) Computational Mathematics (2019)   |
| Master's degree (1 major) Mathematics (2019)   |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)               |
| Master's degree (1 major) Computer Science (2021)  |
| Master's degree (1 major) Computational Mathematics (2022)   |
| Master's degree (1 major) Mathematics (2022)   |
| Master's degree (1 major) Computer Science (2023)  |
| Master's degree (1 major) Computational Mathematics (2024)   |
| Master's degree (1 major) Mathematics (2024)   |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)               |
| Master's degree (1 major) Computer Science (2025)  |

| Module title  |  |   |                       | Abbreviation         |  |  |
|---|--|---|-----------------------|----------------------|--|--|
| Multimodal User Interfaces  |  |   | 10-HCI=MMUI-161-m01   |                      |  |  |
| Module  | e coord  | inator  |                       | Module offered by    |  |  |
| holder  | ofthe  | Chair of Computer Scienc  | e IX                  | Institute of Comput  | er Science   |  |
| ECTS  |  | od of grading   | Only after succ. com  | pl. of module(s)     |  |  |
| 5   | nume   | rical grade   |                       |                      |  |  |
| Duratio   | on   | Module level  | Other prerequisites   |                      |  |  |
| 1 seme  | ster   | graduate  |                       |                      |  |  |
| Conten  | ts   |   |                       |                      |  |  |
| ze, to c<br>well as<br>sing. In<br>derstar<br>ved bet<br>sary to<br>In this<br>dal inp<br>ry exan<br>1. A/D c<br>2. Segr<br>3. Synt<br>4. Sem<br>5. Prag<br>6. Disc<br>A speci<br>terdepo | The multimodal interaction paradigm simultaneously uses various modalities like speech, gesture, touch, or ga-<br>ze, to communicate with computers and machines. Basically, multimodal interaction includes the analysis as<br>well as the synthesis of multimodal utterances. This course concentrates on the analysis, i.e., the input proces-<br>sing. Input processing has the goal to derive meaning from signal to provide a computerized description and un-<br>derstanding of the input and to execute the desired interaction. In multimodal systems, this process is interlea-<br>ved between various modalities and multiple interdependencies exist between simultaneous utterances neces-<br>sary to take into account for a successful machine interpretation.<br>In this course, students will learn about the necessary steps involved in processing unimodal as well as multimo-<br>dal input. The course will highlight typical stages in multimodal processing. Using speech processing as a prima-<br>ry example, they learn about:<br>1. A/D conversion<br>2. Segmentation<br>3. Syntactical analysis<br>4. Semantic analysis<br>5. Pragmatic analysis<br>6. Discourse analysis<br>6. Discourse analysis<br>7. Aspecific emphasize will be on stages like morphology and semantic analysis. Typical aspects of multimodal in-<br>terdependencies, i.e., temporal and semantic interrelations are highlighted and consequences for an algorithmic<br>processing are derived. Prominent multimodal integration (aka multimodal fusion) approaches are described, in- |   |                       |                      |  |  |
| Intende   | ed lear  | ning outcomes   |                       |                      |  |  |
| standir   | ng of al   |   | olved and will know p | prominent algorithmi | ces. They will have a broad under-<br>ic solutions for each of them. Stu-<br>is. |  |
| Course  | <b>s</b> (type   | , number of weekly conta  | ct hours, language —  | if other than Germa  | in)  |  |
| V (2) +   | Ü (2)  |   |                       |                      |  |  |
|   |  | <b>sessment</b> (type, scope, la<br>ion on whether module ca    |                       |                      | tion offered — if not every seme-  |  |
|   | age of a   | of project results (approx.<br>issessment: German and,<br>bonus |                       |                      |  |  |
| Allocat   | ion of   | places  |                       |                      |  |  |
|   |  |   |                       |                      |  |  |
| Additional information  |  |   |                       |                      |  |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):<br>HCI,GE.  |  |   |                       |                      |  |  |
| Worklo  | ad   |   |                       |                      |  |  |
| 150 h   |  |   |                       |                      |  |  |
| Teachi  | ng cycl  | e   |                       |                      |  |  |
|   |  |   |                       |                      |  |  |
|   |  |   |                       |                      |  |  |

| Referred to in LPO I (examination regulations for teaching-degree programmes)                      |
|--|
| § 22 II Nr. 3 b)   |
| Module appears in  |
| Master's degree (1 major) Computer Science (2016)  |
| Master's degree (1 major) Mathematics (2016)   |
| Master's degree (1 major) Computational Mathematics (2016)   |
| Master's degree (1 major) Computer Science (2017)  |
| Master's degree (1 major) Computer Science (2018)  |
| Master's degree (1 major) Computational Mathematics (2019)   |
| Master's degree (1 major) Mathematics (2019)   |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)               |
| Master's degree (1 major) Aerospace Computer Science (2020)  |
| Master's degree (1 major) Computer Science (2021)  |
| Master's degree (1 major) Aerospace Computer Science (2021)  |
| Master's degree (1 major) Computational Mathematics (2022)   |
| Master's degree (1 major) Mathematics (2022)   |
| Master's degree (1 major) Computer Science (2023)  |
| Master's degree (1 major) Aerospace Computer Science (2023)  |
| Master's degree (1 major) Computational Mathematics (2024)   |
| Master's degree (1 major) Mathematics (2024)   |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)               |
| Master's degree (1 major) Computer Science (2025)  |

| Module title  |  |   | Abbreviation  |  |   |
|---|--|---|---|--|---|
| Real-T  | Real-Time Interactive Systems 10-HCI=RIS-182-m01         |   |   |  |   |
| Module coordinator  |  | Module offered by   |   |  |   |
| holder of the Chair of Computer Science IX  |  | e IX  | Institute of Comput   | er Science   |   |
| ECTS  | 1  | od of grading   | Only after succ. con  | npl. of module(s)  |   |
| 5   | nume   | rical grade   |   |  |   |
| Durati  | on   | Module level  | Other prerequisites   |  |   |
| 1 seme  | ester  | graduate  |   |  |   |
| Conter  | nts  |   |   |  |   |
| This course provides an introduction into the requirements, concepts, and engineering art of highly interactive human-computer systems. Such systems are typically found in perceptual computing, Virtual, Augmented, Mixed Reality, computer games, and cyber-physical systems. Lately, these systems are often termed Real-Time Interactive Systems (RIS) due to their common aspects.<br>The course covers theoretical models derived from the requirements of the application area as well as common hands-on and novel solutions necessary to tackle and fulfill these requirements. The first part of the course will concentrate on the conceptual principles characterizing real-time interactive systems. Questions answered are: What are the main requirements? How do we handle multiple modalities? How do we define the timeliness of RIS? Why is it important? What do we have to do to assure timeliness? The second part will introduce a conceptual model of the mission-critical aspects of time, latencies, processes, and events necessary to describe a system's behavior. The third part introduces the application state, it's requirements of distribution and coherence, and the consequences these requirements have on decoupling and software quality aspects in general. The last part introduces some potential solutions to data redundancy, distribution, synchronization, and interoperability. Along the way, typical and prominent state-of-the-art approaches to reoccurring engineering tasks are discussed. This includes pipeline systems, scene graphs, application graphs (aka field routing), event systems, entity and component models, and others. Novel concepts like actor models and ontologies will be covered as alternative solutions. The theoretical and conceptual discussions will be put into a practical context of today's commercial and research systems, e.g., X3D, instant reality, Unity3d, Unreal Engine 4, and Simulator X. |  |   |   |  |   |
|   |  | ning outcomes   |   |  |   |
| physio<br>gical c<br>can ex<br>to solv<br>to dev  | ological<br>haracte<br>pect fro<br>re a give<br>elop alt | and psychological charac<br>ristics of today's comput<br>m today's technological<br>en engineering task in thi<br>ernative approaches for f | cteristics of the huma<br>er systems. Participa<br>solutions. They will b<br>s application area an<br>future real-time intera | an users as well as b<br>nts will gain a solid u<br>e able to choose the<br>d they will have a we<br>active systems. | onditions defined by both, the<br>y the architectures and technolo-<br>understanding about what they<br>appropriate approach and tools<br>ell-founded basis enabling them |
|   |  | , number of weekly conta  | ict hours, language –   | - if other than Germa  | n)  |
| V (2) +   |  |   |   |  |   |
|   |  | <b>sessment</b> (type, scope, la<br>ion on whether module ca  |   |  | tion offered — if not every seme-   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus  |  |   |   |  |   |
| Alloca  | tion of  | olaces  |   |  |   |
|   |  |   | -   |  |   |
| Additi  | onal inf   | ormation  |   |  |   |
| Focuse  | es avail   |   | • =   | -  | r Science, 120 ECTS credits): HCI.  |

Master's with 1 major Computer Science (2018)

#### Workload

150 h

Teaching cycle

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

§ 22 II Nr. 3 b)

#### Module appears in

Master's degree (1 major) Computer Science (2018)

Master's degree (1 major) Information Systems (2019)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Master's degree (1 major) Computer Science (2021)

Master's degree (1 major) Information Systems (2022)

Master's degree (1 major) Computer Science (2023)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Computer Science (2025)

| Modul                                  |   |   |  |  | Abbreviation  |
|--|---|---|--|--|---|
| 3D Poi                                 | nt Clou   | d Processing  |  |  | 10-l=3D-161-m01   |
| Module                                 | e coord   | inator  |  | Module offered by  | <u> </u>  |
|  |   | Chair of Computer Scienc  | e XVII   | Institute of Comput  | ter Science   |
| ECTS                                   | 1   | od of grading   | Only after succ. com   | •  |   |
| 5                                      |   | rical grade   |  |  |   |
| Duratio                                | on  | Module level  | Other prerequisites  |  |   |
| 1 semester graduate                    |   |   |  |  |   |
| Conten                                 | ts  |   |  |  |   |
|  | , regist  |   |  |  | oc-trees), calculating normals, k-<br>mapping, applications to mobile |
| Intend                                 | ed lear   | ning outcomes   |  |  |   |
| munica<br>data pi<br>require           | ate with<br>rocessi<br>ments,                         | engineers / surveyors /<br>ng and have experienced<br>in terms of memory requ                         | CV people / etc. Stud<br>that real application<br>irements and in term | lents are able to solv<br>scenarios are challe<br>is of implementation |   |
| Course                                 | <b>s</b> (type  | , number of weekly conta  | ect hours, language —  | - if other than Germa  | an)   |
| V (2) +<br>Module                      |   | t in: English   |  |  |   |
|  |   | <b>sessment</b> (type, scope, la<br>ion on whether module c   |  |  | ation offered — if not every seme-                                    |
| lf anno<br>examir<br>prox. 1<br>Separa | unced<br>nation o<br>5 minut<br>ite writt<br>age of a | of one candidate each (ap<br>tes per candidate).<br>ten examination for Mast<br>ssessment: German and | inning of the course,<br>oprox. 20 minutes) or<br>er's students.       |  | ition may be replaced by an oral<br>n in groups of 2 candidates (ap-  |
| Allocat                                | ion of <sub>l</sub>                                   | olaces  |  |  |   |
|  |   |   |  |  |   |
| Additio                                | onal inf  | ormation  |  |  |   |
| Focuse<br>IS,LR,H                      |   | able for students of the N  | Aaster's programme li  | nformatik (Compute   | r Science, 120 ECTS credits):   |
| Worklo                                 | ad  |   |  |  |   |
| 150 h                                  |   |   |  |  |   |
| Teachi                                 | ng cycl   | e   |  |  |   |
|  |   |   |  |  |   |
| Referre                                | ed to in  | LPOI (examination regu  | llations for teaching-o  | degree programmes)   |   |
|  |   |   |  |  |   |
| Module                                 | e appea   | ars in  |  |  |   |
|  |   | ee (1 major) Computer Sc  | cience (2016)  |  |   |
|  | -   | ee (1 major) Computer Sc  |  |  |   |
| Master                                 | 's degr   | ee (1 major) Computer Sc  | ience (2018)   |  |   |

| Module title Abbreviation                         |   |  |                        |   |                       |               |
|---|---|--|------------------------|---|-----------------------|---------------|
| Advanced Automation 10-I=AA-152-m01               |   |  |                        |   |                       |               |
| Modula  | Module coordinator Module offered by              |  |                        |   |                       |               |
|   |   |  |                        | -   | or Science            |               |
|   |   | Chair of Computer Scien                            |                        | Institute of Comput   |                       |               |
| ects  |   | od of grading<br>rical grade                       | Only after succ. con   | npl. of module(s)   |                       |               |
| 8   | ·   | -  |                        |   |                       |               |
| Duratio   |   | Module level                                       | Other prerequisites    |   |                       |               |
| 1 seme  |   | graduate   |                        |   |                       |               |
| Conten  |   |  |                        |   |                       |               |
|   |   | ics in automation syste<br>nsor data processing, a |                        |   |                       |               |
| Intend  | ed learı  | ning outcomes                                      |                        |   |                       |               |
| The stu   | Idents I  | nave an advanced know                              | ledge of selected topi | cs in automation sys  | tems. They are able   | to imple-     |
|   |   | d automation systems.                              |                        |   | ````                  |               |
|   |   | , number of weekly con                             | tact hours, language – | - if other than Germa   | n)                    |               |
| V (4) +   |   |  |                        |   |                       |               |
|   |   | <b>essment</b> (type, scope, on on whether module  |                        |   | tion offered — if not | every seme-   |
|   |   | nation (approx. 60 to 12                           | o minutes)             |   |                       |               |
|   | ble for   |  |                        |   |                       |               |
| Allocal   | ion of p  | JIALES   |                        |   |                       |               |
|   |   |  |                        |   |                       |               |
|   |   | ormation   |                        |   |                       |               |
|   | s availa<br>5,LR,GE                               | able for students of the                           | Master's programme I   | nformatik (Computer   | Science, 120 ECTS     | credits):     |
| Worklo  | ad  |  |                        |   |                       |               |
| 240 h   |   |  |                        |   |                       |               |
| Teachi  | ng cvcl   | 6  |                        |   |                       |               |
|   |   | -  |                        |   |                       |               |
| Deferre   | d to in   | LPOI (examination reg                              | ulations for toaching  | dagraa programmac)  |                       |               |
|   | -   |  |                        | legree programmes)  |                       |               |
| § 22  | -   |  |                        |   |                       |               |
| Module  |   |  |                        |   |                       |               |
|   | -   | ee (1 major) Space Scie                            | •, •                   |   |                       |               |
|   |   | mination for the teachir                           |                        | Computer Science (2   | 2015)                 |               |
|   | -   | ee (1 major) Computer S                            |                        |   |                       |               |
|   | -   | ee (1 major) Mathematio                            |                        |   |                       |               |
|   |   | ee (1 major) Computatio                            |                        |   |                       |               |
|   |   | ning degree Gymnasium                              |                        |   |                       | 016)          |
|   |   | y course MINT Teacher                              |                        | Network Bavaria (EN   | B) (2016)             |               |
|   | Master's degree (1 major) Computer Science (2017) |  |                        |   |                       |               |
| Master's degree (1 major) Computer Science (2018) |   |  |                        |   |                       |               |
|   |   | es (Master) Computer So                            | -                      | <b>`</b>  |                       |               |
|   |   | ee (1 major) Computatio                            |                        | 9)  |                       |               |
|   |   | ee (1 major) Mathematio                            |                        |   |                       | ,             |
|   |   | ning degree Gymnasium                              |                        |   |                       | 020)          |
|   |   | y course MINT Teacher                              |                        |   | B) (2020)             |               |
| Master  | 's degr   | ee (1 major) Computatio                            | onal Mathematics (202  | 2)  |                       |               |
| Master's w  | ith 1 majoı                                       | r Computer Science (2018)                          |                        | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                       | page 18 / 140 |



Master's degree (1 major) Mathematics (2022)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

| Module title Abbreviation                |   |  |  |   |                       |               |
|--|---|--|--|---|-----------------------|---------------|
| Compu                                    | Computational Geometry 10-I=AG-161-m01  |  |  |   |                       |               |
| Module                                   | e coord   | inator   |  | Module offered by   |                       |               |
| holder                                   | of the (  | Chair of Computer Scienc   | e l  | Institute of Comput   | er Science            |               |
| ECTS                                     | Metho   | od of grading  | Only after succ. con                                       | npl. of module(s)   |                       |               |
| 5  | 1   | rical grade  |  | -   |                       |               |
| Duratio                                  | on  | Module level   | Other prerequisites  |   |                       |               |
| 1 seme                                   | ster  | graduate   |  |   |                       |               |
| Conten                                   | its   |  |  |   |                       |               |
| formati<br>algoriti                      | In many areas of computer science for example robotics, computer graphics, virtual reality and geographic in-<br>formation systems it is necessary to store, analyse, create or manipulate spatial data. This class is about the<br>algorithmic aspects of these tasks: We will acquire techniques that are needed to plan and analyse geometric al-<br>gorithms and data structures. Every technique will be illustrated with a problem in the practical areas listed abo- |  |  |   |                       |               |
| Intend                                   | ed learr  | ning outcomes  |  |   |                       |               |
| metric                                   | probler   | are able to decide which<br>n. The students are able<br>concepts and techniques  | to analyse new probl                                       | ems and to come up  |                       |               |
| Course                                   | <b>s</b> (type,   | , number of weekly conta   | ict hours, language –                                      | - if other than Germa   | n)                    |               |
| V (2) +                                  | Ü (2)   |  |  |   |                       |               |
| ster, in<br>written<br>If anno<br>examir | formati<br>examir<br>unced l<br>nation o  | <b>Ressment</b> (type, scope, la<br>on on whether module ca<br>nation (approx. 60 to 120<br>by the lecturer at the beg<br>f one candidate each (ap | an be chosen to earn<br>minutes).<br>inning of the course, | a bonus)<br>the written examina                               | tion may be replaced  | d by an oral  |
| Langua                                   |   | es per candidate).<br>ssessment: German and,<br>bonus  | /or English  |   |                       |               |
| Allocat                                  | ion of p  | olaces   |  |   |                       |               |
|  |   |  |  |   |                       |               |
| Additio                                  | onal info   | ormation   |  |   |                       |               |
| Focuse<br>AT,HCI,                        |   | able for students of the M   | laster's programme l                                       | nformatik (Computer   | Science, 120 ECTS o   | redits):      |
| Worklo                                   | ad  |  |  |   |                       |               |
| 150 h                                    |   |  |  |   |                       |               |
| _  | ng cycl   | 9  |  |   |                       |               |
|  | <u> </u>  | -  |  |   |                       |               |
| Roforro                                  | d to in   | LPOI (examination regu   | lations for teaching.                                      | legree programmes)  |                       |               |
|  |   |  |  |   |                       |               |
| Module                                   | e appea   | rs in  |  |   |                       |               |
|  |   | ee (1 major) Computer Sc   | ience (2016)   |   |                       |               |
|  | -   | ee (1 major) Mathematics   |  |   |                       |               |
|  | -   | ee (1 major) Computation   |  | 6)  |                       |               |
|  | -   | ning degree Gymnasium I  |  |   | ork Bavaria (ENB) (20 | 016)          |
|  |   | y course MINT Teacher E  |  |   |                       |               |
| Master                                   | 's degre  | ee (1 major) Computer Sc   | ience (2017)   |   |                       |               |
|  | -   | ee (1 major) Computer Sc   |  |   |                       |               |
|  | -   | ee (1 major) Computation   |  | -   |                       |               |
| Master's w                               | ith 1 major   | Computer Science (2018)  |  | ırg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                       | page 20 / 140 |

Master's degree (1 major) Mathematics (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Aerospace Computer Science (2021) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Aerospace Computer Science (2023)

| Module title  | Abbreviation                                   |                     |                                   |  |  |
|---|--|---------------------|-----------------------------------|--|--|
| Selected Topics of Games Engineering  | 10-I=AGE-182-m01                               |                     |                                   |  |  |
| Module coordinator  |  | Module offered by   |                                   |  |  |
| holder of the Chair of Computer Scienc  | e IX   | Institute of Comput | er Science                        |  |  |
| ECTS Method of grading  | Only after succ. com                           | pl. of module(s)    |                                   |  |  |
| 5 numerical grade   |  |                     |                                   |  |  |
| Duration Module level   | Other prerequisites                            |                     |                                   |  |  |
| 1 semester graduate   |  |                     |                                   |  |  |
| Contents  |  |                     |                                   |  |  |
| Selected chapters of Games Engineerir   | ig.  |                     |                                   |  |  |
| Intended learning outcomes  |  |                     |                                   |  |  |
| The students understand the basic app<br>complex problems in this area and app  |  |                     | le to understand the solutions of |  |  |
| Courses (type, number of weekly conta   | ct hours, language —                           | if other than Germa | n)                                |  |  |
| V (2) + Ü (2)   |  |                     |                                   |  |  |
| <b>Method of assessment</b> (type, scope, la ster, information on whether module ca   |  |                     | tion offered — if not every seme- |  |  |
| written examination (approx. 60 to 120<br>If announced by the lecturer at the beg<br>examination of one candidate each (ap<br>prox. 15 minutes per candidate).<br>Language of assessment: German and,<br>creditable for bonus | inning of the course,<br>pprox. 20 minutes) or |                     |                                   |  |  |
| Allocation of places  |  |                     |                                   |  |  |
|   |  |                     |                                   |  |  |
| Additional information  |  |                     |                                   |  |  |
| Focuses available for students of the N   | laster's programme li                          | nformatik (Computer | Science, 120 ECTS credits): GE.   |  |  |
| Workload  |  |                     |                                   |  |  |
| 150 h   |  |                     |                                   |  |  |
| Teaching cycle  |  |                     |                                   |  |  |
|   |  |                     |                                   |  |  |
| Referred to in LPO I (examination regu  | lations for teaching-o                         | legree programmes)  |                                   |  |  |
|   |  |                     |                                   |  |  |
| Module appears in   |  |                     |                                   |  |  |
| Master's degree (1 major) Computer Sc   | ience (2018)                                   |                     |                                   |  |  |

| Module title   |  |   |                      |                      | Abbreviation                      |  |
|--|--|---|----------------------|----------------------|-----------------------------------|--|
| Selected Topics of Games Engineering   |  |   |                      |                      | 10-I=AGE-191-m01                  |  |
| Module   | e coordi   | inator  |                      | Module offered by    |                                   |  |
| holder   | of the C   | Chair of Computer Scienc                              | e IX                 | Institute of Compute | er Science                        |  |
| ECTS   |  | od of grading   | Only after succ. com | pl. of module(s)     |                                   |  |
| 5  | numei  | rical grade   |                      |                      |                                   |  |
| Duratio  |  | Module level  | Other prerequisites  |                      |                                   |  |
| 1 seme   | ster   | graduate  |                      |                      |                                   |  |
| Conten   | ts   |   |                      |                      |                                   |  |
| Selecte  | d chap   | ters of Games Engineerir                              | ig.                  |                      |                                   |  |
| Intende  | ed learr   | ning outcomes   |                      |                      |                                   |  |
|  |  | understand the basic app<br>lems in this area and app |                      |                      | le to understand the solutions of |  |
| Course   | <b>s</b> (type,  | , number of weekly conta                              | ct hours, language — | if other than Germa  | n)                                |  |
| V (2) +  | Ü (2)  |   |                      |                      |                                   |  |
| ster, inf<br>written<br>If annot<br>examin<br>prox. 15<br>Langua<br>credital<br>Allocat<br><br>Additio | Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus<br>Allocation of places<br><br>Additional information |   |                      |                      |                                   |  |
| Worklo   |  |   |                      |                      | Science, 120 ECTS credits): GE.   |  |
| 150 h  |  |   |                      |                      |                                   |  |
| Teachir  | ng cycle   | e   |                      |                      |                                   |  |
|  |  |   |                      |                      |                                   |  |
| Referre  | <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |   |                      |                      |                                   |  |
|  |  |   |                      |                      |                                   |  |
| Module   | appea  | in in   |                      |                      |                                   |  |
|  | -  | ee (1 major) Computer Sc                              |                      |                      |                                   |  |
| Master   | Master's degree (1 major) Computer Science (2021)  |   |                      |                      |                                   |  |

| Module   | title   |   |                               | Abbreviation           |               |
|--|---|---|-------------------------------|------------------------|---------------|
| Algorith   | hms for Geographic Informat   |   | 10-l=AGIS-161-m01             |                        |               |
| Module coordinator   |   |   | Module offered by             |                        |               |
| holder   | of the Chair of Computer Scie   | nce l   | Institute of Comput           | er Science             |               |
| ECTS   | Method of grading   | Only after succ. cor                                  |                               |                        |               |
| 5  | numerical grade   |   |                               |                        |               |
| Duratio  |   | Other prerequisites                                   |                               |                        |               |
| 1 semes  |   |   |                               |                        |               |
| Conten   |   |   |                               |                        |               |
| sition, p<br>misatio   | nmic foundations of geograph<br>processing, analysis and pres<br>n. Applications such as the c<br>nning as well as cartographic | sentation of spatial info<br>reation of digital heigh | rmation. Processes            | of discrete and conti  | nuous opti-   |
| Intende  | ed learning outcomes  |   |                               |                        |               |
|  | dents are able to formalise a<br>ct and improve suitable appro  |   |                               | ic information syste   | ms as well as |
| Courses  | s (type, number of weekly co  | ntact hours, language –                               | - if other than Germa         | n)                     |               |
| V (2) + ĺ  | Ü (2)   |   |                               |                        |               |
| Method   | l of assessment (type, scope  | , language — if other th                              | an German, examina            | ition offered — if not | every seme-   |
| ster, inf  | formation on whether module   | e can be chosen to earn                               | a bonus)                      |                        | ·             |
|  | ole for bonus<br>i <b>on of places</b>  |   |                               |                        |               |
| Additio  | nal information   |   |                               |                        |               |
| Focuses<br>AT,IS,H   | s available for students of the<br>Cl   | e Master's programme I                                | nformatik (Compute            | r Science, 120 ECTS (  | credits):     |
| Worklo   |   |   |                               |                        |               |
| 150 h  |   |   |                               |                        |               |
| Teachin  | ng cycle  |   |                               |                        |               |
|  |   |   |                               |                        |               |
| Referre  | d to in LPO I (examination re   | gulations for teaching-                               | degree programmes)            |                        |               |
| Module   | appears in  |   |                               |                        |               |
|  | s degree (1 major) Computer   | Science (2016)  |                               |                        |               |
|  | s degree (1 major) Mathemat   |   |                               |                        |               |
| Master's degree (1 major) Computational Mathematics (2016)   |   |   |                               |                        |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |   |   |                               |                        |               |
|  | mentary course MINT Teache  |   | Network Bavaria (EN           | B) (2016)              |               |
|  | s degree (1 major) Computer   |   |                               |                        |               |
|  | s degree (1 major) Computer   |   |                               |                        |               |
|  | s degree (1 major) Computat   |   | .9)                           |                        |               |
| Master'  | s degree (1 major) Mathemat   | ICS (2019)  |                               |                        |               |
| Master's wit   | th 1 major Computer Science (2018)  | JMU Würzb   | urg • generated 19-Apr-2025   | • exam.                | page 24 / 140 |
|  |   | reg. data reco  | ord Master (120 ECTS) Informa | itik - 2018            |               |

Master's degree (1 major) Information Systems (2019)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020)

| Modul  | e title  |  |   |  | Abbreviation          |               |
|--|--|--|---|--|-----------------------|---------------|
| Selected Topics in Algorithms 10-I=AKA-161-m01 |  |  |   |  |                       |               |
| Modul  | e coord  | inator   |   | Module offered by  | <u>.</u>              |               |
| holder   | of the (   | Chair of Computer Scier  | nce l   | Institute of Comput  | er Science            |               |
| ECTS   | -  | od of grading  | Only after succ. con                              |  |                       |               |
| 5  | ·  | rical grade  |   |  |                       |               |
| Durati   | <u> </u>   | Module level   | Other prerequisites                               |  |                       |               |
| 1 seme   | -  | graduate   |   |  |                       |               |
| Conter   |  | 3.44440  |   |  |                       |               |
| Select   | ed topic   | s in algorithmics.   |   |  |                       |               |
|  |  | ning outcomes  |   |  |                       |               |
|  | _  |  |   |  |                       |               |
|  |  | understand the basic appropriate the second structure of the second second structure of the second structure of the second second structure of the second seco |   |  |                       | erstand the   |
| Course   | es (type   | , number of weekly con   | tact hours, language –                            | - if other than Germa  | ın)                   |               |
| V (2) +  | Ü (2)  |  |   |  |                       |               |
|  |  | essment (type, scope, on on whether module   |   |  | tion offered — if not | every seme-   |
| lf anno<br>examir<br>prox. 1<br>Langua         | ounced l<br>nation o<br>5 minut                            | nation (approx. 60 to 12<br>by the lecturer at the be<br>of one candidate each (a<br>es per candidate).<br>ssessment: German an<br>bonus   | eginning of the course,<br>approx. 20 minutes) or |  |                       |               |
|  | tion of p  |  |   |  |                       |               |
| Alloca   |  | Jaces  |   |  |                       |               |
|  |  |  |   |  |                       |               |
|  | -  | ormation   |   |  |                       |               |
| Focuse<br>AT                                   | es availa  | able for students of the   | Master's programme I                              | nformatik (Compute   | r Science, 120 ECTS ( | credits):     |
| Worklo   | bad  |  |   |  |                       |               |
| 150 h  |  |  |   |  |                       |               |
|  | ng cycl  | <u>م</u>   |   |  |                       |               |
| reaction                                       | ing cyce   |  |   |  |                       |               |
| Deferm   |  |  |   | d  |                       |               |
| Referre  |  | LPOI (examination reg  | gulations for teaching-                           | degree programmes)   |                       |               |
|  |  |  |   |  |                       |               |
| Modul  | e appea  | irs in   |   |  |                       |               |
| Master   | r's degro  | ee (1 major) Computer S  | Science (2016)                                    |  |                       |               |
|  | -  | ee (1 major) Mathemati   |   |  |                       |               |
|  | -  | ee (1 major) Computatio  |   | 6)   |                       |               |
|  |  | ee (1 major) Computer S  |   |  |                       |               |
|  | Master's degree (1 major) Computer Science (2018)          |  |   |  |                       |               |
|  | Master's degree (1 major) Computational Mathematics (2019) |  |   |  |                       |               |
|  | -  | ee (1 major) Mathemati   | -   |  |                       |               |
|  |  | ning degree Gymnasium  |   |  |                       | 020)          |
|  |  | y course MINT Teacher  |   |  | B) (2020)             |               |
|  | -  | ee (1 major) Aerospace   | •   | 20)  |                       |               |
|  | -  | ee (1 major) Computer S  |   | <b>、</b>   |                       |               |
| Master   | r's degro  | ee (1 major) Aerospace   | Computer Science (20                              | 21)  |                       |               |
| Master's w                                     | /ith 1 majoı   | Computer Science (2018)  |   | urg • generated 19-Apr-2025<br>Ird Master (120 ECTS) Informa |                       | page 26 / 140 |



Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022)

| Module title Abbreviation              |   |  | Abbreviation                                   |                     |   |
|--|---|--|--|---------------------|---|
| Selected Topics in Embedded Systems    |   |  |  |                     | 10-I=AKES-161-m01   |
| Module                                 | e coord   | inator   |  | Module offered by   |   |
| Dean o                                 | fStudie   | es Informatik (Computer S  | Science)                                       | Institute of Comput | er Science  |
| ECTS                                   |   | od of grading  | Only after succ. com                           | pl. of module(s)    |   |
| 5                                      | nume  | rical grade  |  |                     |   |
| Duratio                                | on  | Module level   | Other prerequisites                            |                     |   |
| 1 seme                                 | ster  | graduate   |  |                     |   |
| Conten                                 | ts  |  |  |                     |   |
| Selecte                                | ed topic  | s in embedded systems.   |  |                     |   |
| Intend                                 | ed learr  | ning outcomes  |  |                     |   |
|  |   | possess specialised know<br>plex problems in this are                    |  |                     | They are able to understand so-<br>ns.                            |
| Course                                 | <b>s</b> (type,                                   | , number of weekly conta   | ct hours, language —                           | if other than Germa | n)  |
| V (2) +                                | Ü (2)   |  |  |                     |   |
|  |   | e <b>ssment</b> (type, scope, la<br>on on whether module ca              |  |                     | tion offered — if not every seme-                                 |
| lf anno<br>examir<br>prox. 1<br>Langua | unced l<br>nation o<br>5 minut                    | f one candidate each (ap<br>es per candidate).<br>ssessment: German and/ | inning of the course,<br>pprox. 20 minutes) or |                     | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |
| Allocat                                | ion of p  | olaces   |  |                     |   |
|  | · · · ·   |  |  |                     |   |
| Additio                                | onal info   | ormation   |  |                     |   |
| Focuse                                 | s availa  | able for students of the M   | laster's programme li                          | nformatik (Computer | Science, 120 ECTS credits): ES.                                   |
| Worklo                                 | ad  |  |  |                     |   |
| 150 h                                  |   |  |  |                     |   |
| Teachi                                 | ng cycl   | 9  |  |                     |   |
|  | <u> </u>  |  |  |                     |   |
| Referre                                | ed to in  | LPOI (examination regu   | lations for teaching-c                         | legree programmes)  |   |
|  |   |  |  |                     |   |
| Module                                 | e appea   | rs in  |  |                     |   |
| Master                                 | 's degre  | ee (1 major) Computer Sc   | ience (2016)                                   |                     |   |
|  |   | ning degree Gymnasium I<br>y course MINT Teacher Eo                      |  |                     |   |
| Master                                 | Master's degree (1 major) Computer Science (2017) |  |  |                     |   |
|  | -   | ee (1 major) Computer Sc   |  |                     |   |
|  |   | ning degree Gymnasium I  |  |                     |   |
|  |   | y course MINT Teacher Ec<br>ee (1 major) Aerospace Co                    |  |                     | D) (2020)   |
|  |   | ee (1 major) Aerospace Co<br>ee (1 major) Computer Sc                    |  | 20)                 |   |
|  | -   | ee (1 major) Aerospace Co  |  | 21)                 |   |
|  |   | -  |  |                     |   |

| Module title                         |  |  |                        |                      | Abbreviation  |  |  |
|--------------------------------------|--|--|------------------------|----------------------|---|--|--|
| Selecte                              | Selected Topics in HCI 10-I=AKHCI-182-mo1  |  |                        |                      |   |  |  |
| Module                               | e coord  | inator   |                        | Module offered by    |   |  |  |
| holder                               | of the (   | Chair of Computer Scienc   | e IX                   | Institute of Compute | er Science  |  |  |
| ECTS                                 | Metho  | od of grading  | Only after succ. com   | pl. of module(s)     |   |  |  |
| 5                                    | nume   | rical grade  |                        |                      |   |  |  |
| Duratio                              | on   | Module level   | Other prerequisites    |                      |   |  |  |
| 1 seme                               | ester  | graduate   |                        |                      |   |  |  |
| Conten                               | nts  |  |                        |                      |   |  |  |
| Selecte                              | ed topic   | cs in HCI.   |                        |                      |   |  |  |
|                                      |  | ning outcomes  |                        |                      |   |  |  |
|                                      |  | understand the basic app<br>omplex problems in this a                      |                        |                      | ey are able to understand the<br>ions.                            |  |  |
| Course                               | <b>s</b> (type   | , number of weekly conta   | ct hours, language —   | if other than Germa  | n)  |  |  |
| V (2) +                              | Ü/S (2)  |  |                        |                      |   |  |  |
|                                      |  | sessment (type, scope, la<br>ion on whether module ca                      |                        |                      | tion offered — if not every seme-                                 |  |  |
| examir<br>prox. 1<br>Langua          | nation c<br>5 minut  | of one candidate each (ap<br>tes per candidate).<br>ssessment: German and, | prox. 20 minutes) or   |                      | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |  |  |
| Allocat                              | tion of p  | olaces   |                        |                      |   |  |  |
|                                      |  |  |                        |                      |   |  |  |
| Additio                              | onal inf   | ormation   |                        |                      |   |  |  |
| Focuse                               | es availa  | able for students of the N   | laster's programme li  | nformatik (Computer  | Science, 120 ECTS credits): HCI.                                  |  |  |
| Worklo                               | ad   |  |                        |                      |   |  |  |
| 150 h                                |  |  |                        |                      |   |  |  |
| Teachi                               | ng cycl  | e  |                        |                      |   |  |  |
|                                      |  |  |                        |                      |   |  |  |
| Referre                              | ed to in   | LPOI (examination regu   | lations for teaching-o | legree programmes)   |   |  |  |
|                                      |  |  |                        |                      |   |  |  |
| Module appears in                    |  |  |                        |                      |   |  |  |
| Master<br>Supple<br>Master<br>Master | Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) Aerospace Computer Science (2020)<br>Master's degree (1 major) Computer Science (2021)<br>Master's degree (1 major) Aerospace Computer Science (2021) |  |                        |                      |   |  |  |
|                                      |  |  |                        |                      |   |  |  |

| Module title                                   |   |  | Abbreviation           |                     |   |
|--|---|--|------------------------|---------------------|---|
| Selected Topics in Computer Science            |   |  |                        |                     | 10-I=AKII-182-m01   |
| Module   | e coord   | inator   |                        | Module offered by   |   |
| Dean of  | f Studie  | es Informatik (Computer S  | Science)               | Institute of Comput | er Science  |
| ECTS   |   | od of grading  | Only after succ. com   | pl. of module(s)    |   |
| 5  | nume  | rical grade  | -                      |                     |   |
| Duratio  | n   | Module level   | Other prerequisites    |                     |   |
| 1 seme   | ster  | graduate   |                        |                     |   |
| Conten   | ts  |  |                        |                     |   |
| Selecte  | d topic   | s in computer science.   |                        |                     |   |
| Intende  | ed learı  | ning outcomes  |                        |                     |   |
|  |   | are able to understand th<br>d questions.                                | e solutions to comple  | ex problems in comp | outer science and to transfer                                     |
| Course   | <b>s</b> (type  | , number of weekly conta   | ct hours, language —   | if other than Germa | n)  |
| V (2) +  |   |  |                        |                     |   |
|  |   | essment (type, scope, la on on whether module ca                         |                        |                     | tion offered — if not every seme-                                 |
| examin<br>prox. 15                             | ation o<br>5 minut<br>ge of a   | f one candidate each (ap<br>es per candidate).<br>ssessment: German and/ | prox. 20 minutes) or   |                     | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |
| Allocat  | ion of p  | olaces   |                        |                     |   |
|  |   |  |                        |                     |   |
| Additio  | nal inf   | ormation   |                        |                     |   |
|  |   |  |                        |                     |   |
| Worklo   | ad  |  |                        |                     |   |
| 150 h  |   |  |                        |                     |   |
| Teachir  | ng cycl   | e  |                        |                     |   |
|  |   |  |                        |                     |   |
| Referre  | d to in   | LPOI (examination regu   | lations for teaching-c | legree programmes)  |   |
|  |   |  |                        |                     |   |
| Module   | e appea   | ars in   |                        |                     |   |
| Master<br>Supple<br>Master<br>Master<br>Master | Module appears in<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) Aerospace Computer Science (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)<br>Master's degree (1 major) Computer Science (2021)<br>Master's degree (1 major) Aerospace Computer Science (2021) |  |                        |                     |   |

| Module title                           |   |  |  | Abbreviation          |   |
|--|---|--|--|-----------------------|---|
|  | Selected Topics in Intelligent Systems  |  |  |                       |   |
| Module                                 | e coord   | inator   |  | Module offered by     |   |
| holder                                 | of the (  | Chair of Computer Science  | e VI   | Institute of Comput   | er Science  |
| ECTS                                   | Metho   | od of grading  | Only after succ. con                           | npl. of module(s)     |   |
| 5                                      | nume  | rical grade  |  |                       |   |
| Duratio                                | on  | Module level   | Other prerequisites                            |                       |   |
| 1 seme                                 | ster  | graduate   |  |                       |   |
| Conten                                 | ts  |  |  |                       |   |
| Selecte                                | ed topic  | s in intelligent systems.  |  |                       |   |
|  |   | ning outcomes  |  |                       |   |
| The stu                                | idents j  |  |  |                       | . They are able to understand so-<br>ns.                          |
| Course                                 | s (type   | , number of weekly conta   | ct hours, language –                           | - if other than Germa | n)  |
| V (2) +                                |   | ,  |  |                       | ·   |
| Metho                                  | d of ass  | <b>Sessment</b> (type, scope, la<br>on on whether module ca                      |  |                       | tion offered — if not every seme-                                 |
| lf anno<br>examir<br>prox. 1<br>Langua | unced l<br>nation o<br>5 minut  | of one candidate each (ap<br>res per candidate).<br>ssessment: German and/       | inning of the course,<br>pprox. 20 minutes) or |                       | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |
|  | ion of p  |  |  |                       |   |
|  |   |  |  |                       |   |
| Additic                                | onal inf  | ormation   |  |                       |   |
| Focuse                                 | s availa  | able for students of the M   | laster's programme l                           | nformatik (Computer   | Science, 120 ECTS credits): IS.                                   |
| Worklo                                 | ad  |  |  |                       |   |
| 150 h                                  |   |  |  |                       |   |
|  | ng cycl   | e  |  |                       |   |
|  |   | -  |  |                       |   |
| Poforro                                | d to in   | LPOI (examination regu   | lations for toaching                           | dogroo programmos)    |   |
| Kelene                                 |   |  |  |                       |   |
|  |   | •  |  |                       |   |
|  | e appea   |  | • ( )  |                       |   |
| Master<br>Supple<br>Master             | Master's degree (1 major) Computer Science (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018) |  |  |                       |   |
| Master<br>Supple                       | 's teach<br>mentar  | ning degree Gymnasium I<br>y course MINT Teacher Ec<br>ee (1 major) Aerospace Co | MINT Teacher Educati<br>ducation PLUS, Elite I | Network Bavaria (ENI  |   |
|  |   |  |  |                       |   |

|   |  |   |  |   | Abbreviation                  |               |  |
|---|--|---|--|---|-------------------------------|---------------|--|
| Select  | Selected Topics in Internet Technologies 10-I=AKIT-161-mo1   |   |  |   |                               |               |  |
| Modul   | e coordi   | nator   |  | Module offered by   | l                             |               |  |
| holder  | of the C   | hair of Computer Scier  | ice III  | Institute of Comput   | Institute of Computer Science |               |  |
| ECTS  |  | d of grading  | Only after succ. con                             | Only after succ. compl. of module(s)                          |                               |               |  |
| 5   | r  | ical grade  |  |   |                               |               |  |
| Duratio   |  | Module level  | Other prerequisites                              | i   |                               |               |  |
| 1 seme  |  | graduate  |  |   |                               |               |  |
| Selecte<br>and co<br>works,<br>channe<br>MO), m<br>plannin<br>reverse<br>ment ((<br>ment n<br>visuali<br>ves, or<br><b>Intend</b><br>The stu<br>and wi<br><b>Course</b> | ContentsSelected topics in computer communication, for example design aspects of future internet structures: setup<br>and control structures of the internet, multicast protocols, protocols for multimedia communication, optical net-<br>works, control mechanisms for redundant and real-time communication networks, p2p networks, ad-hoc net-<br>works, or new concepts and technologies in mobile communication: digital modulation, signal propagation,<br>channel coding, modern transmission technologies (adaptive modulation and coding, hybrid ARQ, OFDM, MI-<br>MO), mac layer, mobileIP, routing in ad-hoc networks, vertical handover, UMTS IP multimedia subsystem, or<br>planning and management methods in telecommunication networks: planning methods (forward engineering,<br>reverse engineering), network management paradigms (central and decentral), framework for network manage-<br>ment (IETF traffic engineering, ITU-T TMN, OSI management), planning and management methods (IP manage-<br>ment mechanisms, network design, measurement, acquisition and evaluation of traffic and performance data,<br>visualisation, result handling, simulation and analysis of networks), management tools, outlook and perspecti-<br>ves, or other current topics.Intended learning outcomesThe students have a knowledge of advanced and current topics in the management and design of modern wired<br>and wireless communication systems.Courses (type, number of weekly contact hours, language — if other than German) |   |  |   |                               |               |  |
| V (2) +   |  | • /.  |  |   |                               |               |  |
| ster, in  | Iformatio  | essment (type, scope,<br>on on whether module   | can be chosen to earn                            |   | tion offered — if not         | every seme-   |  |
| lf anno<br>examir<br>prox. 1<br>Langua  | ounced b<br>nation of<br>5 minute  | ation (approx. 60 to 12<br>y the lecturer at the be<br>one candidate each (a<br>es per candidate).<br>ssessment: German an<br>ponus | ginning of the course,<br>approx. 20 minutes) or |   |                               |               |  |
| Allocat   | tion of p  | laces   |  |   |                               |               |  |
|   |  |   |  |   |                               |               |  |
| Additio   | onal info  | rmation   |  |   |                               |               |  |
| Focuse  | es availa  | ble for students of the   | Master's programme I                             | nformatik (Compute  | r Science, 120 ECTS o         | credits): IT. |  |
| Worklo  | bad  |   |  |   |                               |               |  |
| 150 h   |  |   |  |   |                               |               |  |
| Teachi  | ng cycle   |   |  |   |                               |               |  |
| Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   |  |   |  |   |                               |               |  |
|   |  | e (1 major) Computer S  | Science (2016)                                   |   |                               |               |  |
| Master  | r's teach  | ing degree Gymnasiun<br>/ course MINT Teacher   | n MINT Teacher Educat                            |   |                               | 016)          |  |
|   | -  | Computer Science (2018)   | JMU Würzb  | urg • generated 19-Apr-2025 (<br>rd Master (120 ECTS) Informa | • exam.                       | page 32 / 140 |  |

Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Aerospace Computer Science (2021)

| Module   | e title  |                          | Abbreviation        |                               |  |  |  |  |  |
|--|----------|--------------------------|---------------------|-------------------------------|--|--|--|--|--|
| Selecte  | ed Topi  | cs in IT Security        |                     | 10-I=AKITS-172-m01            |  |  |  |  |  |
| Module   | e coord  | inator                   |                     | Module offered by             |  |  |  |  |  |
| holder   | of the ( | Chair of Computer Scienc | e ll                | Institute of Computer Science |  |  |  |  |  |
| ECTS Method of grading   |          | Only after succ. com     | pl. of module(s)    |                               |  |  |  |  |  |
| 5  | L        | rical grade              |                     |                               |  |  |  |  |  |
| Duration   |          | Module level             | Other prerequisites |                               |  |  |  |  |  |
| 1 semester graduate  |          | graduate                 | <u> -</u>           |                               |  |  |  |  |  |
| Contents   |          |                          |                     |                               |  |  |  |  |  |
| Selected topics in IT security.  |          |                          |                     |                               |  |  |  |  |  |
| Intended learning outcomes   |          |                          |                     |                               |  |  |  |  |  |
| The students possess an advanced knowledge in the area of IT security. They are able to understand solutions to complex problems in this area and to transfer them to related questions.   |          |                          |                     |                               |  |  |  |  |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)   |          |                          |                     |                               |  |  |  |  |  |
| V (2) + Ü (2)<br>Module taught in: English   |          |                          |                     |                               |  |  |  |  |  |
| <b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)  |          |                          |                     |                               |  |  |  |  |  |
| If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: English<br>creditable for bonus |          |                          |                     |                               |  |  |  |  |  |
| Allocat  | ion of p | olaces                   |                     |                               |  |  |  |  |  |
|  |          |                          |                     |                               |  |  |  |  |  |
| Additio  | nal inf  | ormation                 |                     |                               |  |  |  |  |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IS, LR, HCI, ES.   |          |                          |                     |                               |  |  |  |  |  |
| Worklo   | ad       |                          |                     |                               |  |  |  |  |  |
| 150 h  |          |                          |                     |                               |  |  |  |  |  |
| Teaching cycle   |          |                          |                     |                               |  |  |  |  |  |
|  |          |                          |                     |                               |  |  |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |          |                          |                     |                               |  |  |  |  |  |
|  |          |                          |                     |                               |  |  |  |  |  |
| Module appears in  |          |                          |                     |                               |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2017)  |          |                          |                     |                               |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2018)  |          |                          |                     |                               |  |  |  |  |  |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   |          |                          |                     |                               |  |  |  |  |  |
| Mastaria dagrega (a majar) Astronomo Computer Science (2000)   |          |                          |                     |                               |  |  |  |  |  |

Master's degree (1 major) Aerospace Computer Science (2020)

I

| Modul  | e title                                   |                          | Abbreviation                  |   |                     |               |  |  |  |  |
|--|---|--------------------------|-------------------------------|---|---------------------|---------------|--|--|--|--|
| Selected Topics in Aerospace Engineering 10-I=AKLR-161-m01   |   |                          |                               |   |                     |               |  |  |  |  |
| Modul  | e coord                                   | inator                   |                               | Module offered by   | odule offered by    |               |  |  |  |  |
| holder of the Chair of Computer Scienc   |   | ice VII                  | Institute of Computer Science |   |                     |               |  |  |  |  |
| ECTS   | Metho                                     | od of grading            | Only after succ. con          | Only after succ. compl. of module(s)                          |                     |               |  |  |  |  |
| 5  | nume                                      | rical grade              |                               |   |                     |               |  |  |  |  |
| Duratio  | Duration Module level Other prerequisites |                          |                               |   |                     |               |  |  |  |  |
| 1 semester graduate  |   |                          |                               |   |                     |               |  |  |  |  |
| Contents   |   |                          |                               |   |                     |               |  |  |  |  |
| Selected topics in aerospace engineering, for example: satellite communication, rocket science, propulsion sy-<br>stems, sensors and actuators for orientation control, perturbation of orbits, interplanetary orbits, rendezvous<br>and docking, design of space ships, design of planetary bases, life support systems, special aspects of opera-<br>tions, payloads, optical systems, RADAR, earth monitoring, thermo management, structure of space ships, spe-<br>cial areas of navigation, space environment, environment simulation, verification and test of space faring sy-<br>stems, space astronomy and planet missions, space medicine and biology, material science, quality manage-<br>ment, space law, aeroflight topics, avionics for airplanes, air traffic control, areal navigation, pilot interfaces, air<br>traffic control, air traffic management. |   |                          |                               |   |                     |               |  |  |  |  |
| Intend   | ed learr                                  | ning outcomes            |                               |   |                     |               |  |  |  |  |
| The students possess an advanced knowledge about the respective topic of the selected area and are able to consider these foundations in their future plans of air or spaceborne systems.  |   |                          |                               |   |                     |               |  |  |  |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)   |   |                          |                               |   |                     |               |  |  |  |  |
| V (2) + Ü (2)  |   |                          |                               |   |                     |               |  |  |  |  |
| <b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)  |   |                          |                               |   |                     |               |  |  |  |  |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Separate written examination for Master's students.<br>Language of assessment: German and/or English<br>creditable for bonus  |   |                          |                               |   |                     |               |  |  |  |  |
| Allocation of places   |   |                          |                               |   |                     |               |  |  |  |  |
|  |   |                          |                               |   |                     |               |  |  |  |  |
| Additio  | onal info                                 | ormation                 |                               |   |                     |               |  |  |  |  |
| Focuse   | s availa                                  | able for students of the | Master's programme l          | nformatik (Computer   | Science, 120 ECTS o | redits): LR.  |  |  |  |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. <b>Workload</b>  |   |                          |                               |   |                     |               |  |  |  |  |
| 150 h  |   |                          |                               |   |                     |               |  |  |  |  |
| Teaching cycle   |   |                          |                               |   |                     |               |  |  |  |  |
|  |   |                          |                               |   |                     |               |  |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |   |                          |                               |   |                     |               |  |  |  |  |
|  |   |                          |                               |   |                     |               |  |  |  |  |
| Module appears in  |   |                          |                               |   |                     |               |  |  |  |  |
| Master's degree (1 major) Computer Science (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  |   |                          |                               |   |                     |               |  |  |  |  |
|  |   | Computer Science (2018)  | JMU Würzbı                    | Irg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa | exam.               | page 35 / 140 |  |  |  |  |

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Aerospace Computer Science (2021)

| Module title |   |  | Abbreviation           |                      |                                   |
|--------------|---|--|------------------------|----------------------|-----------------------------------|
|              | Selected Topics in Software Engineering 10-I=AKSE-161-m01   |  |                        |                      | 10-I=AKSE-161-m01                 |
| Module       | e coord   | inator                                       |                        | Module offered by    |                                   |
| holder       | of the (  | Chair of Computer Science                    | e ll                   | Institute of Compute | er Science                        |
| ECTS         | Metho   | od of grading                                | Only after succ. com   | pl. of module(s)     |                                   |
| 5            | nume  | rical grade                                  |                        |                      |                                   |
| Duratio      | n   | Module level                                 | Other prerequisites    |                      |                                   |
| 1 seme       | ster  | graduate                                     |                        |                      |                                   |
| Conten       | ts  |  |                        |                      |                                   |
| Selecte      | ed topic  | s in software engineering                    | z.                     |                      |                                   |
|              |   | ning outcomes                                |                        |                      |                                   |
| The stu      | dents p   | oossess an advanced kno                      | owledge about select   | ed aspects of softwa | are engineering.                  |
| Course       | <b>s</b> (type  | , number of weekly conta                     | ct hours, language —   | if other than Germa  | n)                                |
| V (2) +      |   | ,  | , , , ,                |                      |                                   |
|              |   |  |                        |                      | tion offered — if not every seme- |
| ster, in     | formati   | on on whether module ca                      | an be chosen to earn   | a bonus)             |                                   |
|              |   | nation (approx. 60 to 120                    |                        |                      |                                   |
|              |   |  |                        |                      | tion may be replaced by an oral   |
|              |   |  | prox. 20 minutes) or   | an oral examination  | in groups of 2 candidates (ap-    |
|              |   | es per candidate).<br>ssessment: German and/ | or English             |                      |                                   |
| credita      |   |  |                        |                      |                                   |
| Allocat      | ion of p  | olaces                                       |                        |                      |                                   |
|              |   |  |                        |                      |                                   |
| Additio      | nal inf   | ormation                                     |                        |                      |                                   |
| Focuse       | s availa  | able for students of the M                   | laster's programme lı  | nformatik (Computer  | Science, 120 ECTS credits): SE.   |
| Worklo       | ad  |  |                        |                      |                                   |
| 150 h        |   |  |                        |                      |                                   |
| Teachi       | ng cycl   | e  |                        |                      |                                   |
|              |   |  |                        |                      |                                   |
| Referre      | ed to in  | LPO I (examination regu                      | lations for teaching-c | legree programmes)   |                                   |
|              |   |  |                        |                      |                                   |
| Module       | e appea   | irs in                                       |                        |                      |                                   |
| Master       | 's degr   | ee (1 major) Computer Sc                     | ience (2016)           |                      |                                   |
|              |   | ning degree Gymnasium I                      |                        |                      |                                   |
|              |   | y course MINT Teacher Eo                     |                        | Network Bavaria (ENI | B) (2016)                         |
|              | -   | ee (1 major) Computer Sc                     |                        |                      |                                   |
|              | -   | ee (1 major) Computer Sc                     |                        |                      |                                   |
|              |   | ning degree Gymnasium I                      |                        |                      |                                   |
|              |   | y course MINT Teacher Eo                     |                        |                      | B) (2020)                         |
|              | -   | ee (1 major) Aerospace Co                    | •                      | 20)                  |                                   |
|              | -   | ee (1 major) Computer Sc                     |                        | `                    |                                   |
| Master       | Master's degree (1 major) Aerospace Computer Science (2021) |  |                        |                      |                                   |

| Module title   |              |   | Abbreviation           |   |                       |               |
|--|--------------|---|------------------------|---|-----------------------|---------------|
| Selected Topics in Theory  |              |   |                        |   |                       |               |
| Modul  | e coord      | inator  |                        | Module offered by   |                       |               |
|  |              |   | 1                      |   |                       |               |
|  | 1            | Chair of Computer Scier                           | Ĩ.                     | Institute of Comput   | er Science            |               |
| ECTS   | ·            | od of grading                                     | Only after succ. con   | npl. of module(s)   |                       |               |
| 5  | ·            | rical grade                                       |                        |   |                       |               |
| Durati   | -            | Module level                                      | Other prerequisites    |   |                       |               |
| 1 seme   |              | graduate  |                        |   |                       |               |
| Conter   | _            |   |                        |   |                       |               |
| Select   | ed topic     | s in theory.                                      |                        |   |                       |               |
| Intend   | ed learı     | ning outcomes                                     |                        |   |                       |               |
|  |              | understand the basic a<br>pmplex problems in this |                        |   |                       | rstand the    |
| Course   | es (type     | , number of weekly con                            | tact hours, language – | - if other than Germa   | ın)                   |               |
| V (2) +  | Ü (2)        |   |                        |   |                       |               |
|  |              | essment (type, scope, on on whether module        |                        |   | tion offered — if not | every seme-   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus |              |   |                        |   |                       |               |
|  | tion of p    |   |                        |   |                       |               |
|  |              |   |                        |   |                       |               |
| Additi   | onal inf     | ormation  |                        |   |                       |               |
|  | -            | able for students of the                          | Master's programme I   | nformatik (Compute  | r Science, 120 ECTS o | credits):     |
| Worklo   |              |   |                        |   |                       |               |
| 150 h  |              |   | -                      |   |                       |               |
|  | ng cycl      | 0   |                        |   |                       |               |
| Teacin   | ing cycu     | 5   |                        |   |                       |               |
| Deferre  |              | IDOL (avamination rad                             | ulations for too shing |   |                       |               |
| Referre  |              | LPOI (examination reg                             |                        | legree programmes)  |                       |               |
|  |              | •   |                        |   |                       |               |
|  | e appea      |   |                        |   |                       |               |
|  | -            | ee (1 major) Computer S                           |                        |   |                       |               |
|  | -            | ee (1 major) Mathemati                            |                        |   |                       |               |
|  | -            | ee (1 major) Computatio                           |                        | 6)  |                       |               |
| Master's degree (1 major) Computer Science (2017)  |              |   |                        |   |                       |               |
| Master's degree (1 major) Computer Science (2018)  |              |   |                        |   |                       |               |
| Master's degree (1 major) Computational Mathematics (2019)   |              |   |                        |   |                       |               |
| Master's degree (1 major) Mathematics (2019)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   |              |   |                        |   |                       |               |
|  |              |   |                        |   |                       | 020)          |
|  |              | y course MINT Teacher                             |                        |   | В) (2020)             |               |
|  | -            | ee (1 major) Aerospace                            | •                      | 20)   |                       |               |
|  | -            | ee (1 major) Computer S                           |                        | ,   |                       |               |
| Master   | r's degro    | ee (1 major) Aerospace                            | Computer Science (20   | 21)   |                       |               |
| Master's w   | /ith 1 majoı | Computer Science (2018)                           |                        | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                       | page 38 / 140 |



Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022)

| Modul  |  |  |                         |                               | Abbreviation          |               |
|--|--|--|-------------------------|-------------------------------|-----------------------|---------------|
| Approx   | kimatio  | n Algorithms   |                         |                               | 10-I=APA-161-m01      |               |
| Modul  | e coord  | inator   |                         | Module offered by             |                       |               |
| holder   | of the (   | Chair of Computer Scien                              | ce l                    | Institute of Comput           | er Science            |               |
| ECTS   | Metho  | od of grading  | Only after succ. con    | npl. of module(s)             |                       |               |
| 5  | nume   | rical grade  |                         |                               |                       |               |
| Durati   | on   | Module level   | Other prerequisites     |                               |                       |               |
| 1 seme   | ester  | graduate   |                         |                               |                       |               |
| Conter   | nts  |  |                         |                               |                       |               |
|  |  | ding the optimal solutic<br>y problems without an e  |                         |                               |                       |               |
|  |  | h do not always give the                             |                         |                               |                       |               |
|  |  | nalysing techniques for                              |                         |                               |                       |               |
|  |  | nisation problems, the l                             |                         |                               | t drafting technique  | s such as     |
|  |  | earch, scaling as well a                             | s methods based on l    | inear programming.            |                       |               |
| Intend   | ed learı   | ning outcomes  |                         |                               |                       |               |
|  |  | are able to analyse easy                             |                         |                               |                       |               |
|  |  | ting techniques such as<br>I are able to apply these | •                       | and scaling as well a         | s methods based or    | n linear pro- |
| Course   | es (type   | , number of weekly cont                              | act hours, language –   | - if other than Germa         | n)                    |               |
| V (2) +  | Ü (2)  |  |                         |                               |                       |               |
| Metho  | d of ass   | essment (type, scope, l                              | anguage — if other th   | an German, examina            | tion offered — if not | every seme-   |
|  |  | on on whether module of                              |                         |                               |                       |               |
|  |  | nation (approx. 60 to 12                             |                         |                               |                       |               |
|  |  | by the lecturer at the be                            |                         |                               |                       |               |
|  |  | f one candidate each (a<br>es per candidate).        | pprox. 20 minutes) of   |                               | in groups of 2 cand   | iuales (ap-   |
|  |  | ssessment: German and                                | d/or English            |                               |                       |               |
|  | able for   |  | _                       |                               |                       |               |
| Alloca   | tion of p  | olaces   |                         |                               |                       |               |
|  |  |  |                         |                               |                       |               |
| Additio  | onal inf   | ormation   |                         |                               |                       |               |
| Focuse<br>AT,IT,G  |  | able for students of the                             | Master's programme l    | nformatik (Computer           | Science, 120 ECTS (   | credits):     |
| Worklo   |  |  | _                       |                               |                       |               |
| 150 h  |  |  |                         |                               |                       |               |
| Teachi   | ng cycl  | e  |                         |                               |                       |               |
|  |  |  |                         |                               |                       |               |
| Referre  | ed to in   | LPOI (examination reg                                | ulations for teaching-o | degree programmes)            |                       |               |
| § 22    Nr. 3 b)   |  |  |                         |                               |                       |               |
| Module appears in  |  |  |                         |                               |                       |               |
| Master's degree (1 major) Computer Science (2016)          |  |  |                         |                               |                       |               |
| Master's degree (1 major) Mathematics (2016)               |  |  |                         |                               |                       |               |
| Master's degree (1 major) Computational Mathematics (2016) |  |  |                         |                               |                       |               |
|  | Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |  |                         |                               |                       |               |
|  |  | •  |                         | Network Bavaria (EN           | D) (2010)             |               |
|  | -  | ee (1 major) Computer S<br>ee (1 major) Computer S   | -                       |                               |                       |               |
|  |  | Computer Science (2018)                              |                         | Irg • generated 19-Apr-2025 • | exam.                 | page 40 / 140 |
|  | .,-  |  |                         | rd Master (120 ECTS) Informa  |                       |               |

UNIVERSITÄT WÜRZBURG

Module studies (Master) Computer Science (2019) Master's degree (1 major) Computational Mathematics (2019) Master's degree (1 major) Mathematics (2019)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Master's degree (1 major) Computer Science (2021)

Master's degree (1 major) Computational Mathematics (2022)

Master's degree (1 major) Mathematics (2022)

Master's degree (1 major) Computer Science (2023)

Master's degree (1 major) Computational Mathematics (2024)

Master's degree (1 major) Mathematics (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Computer Science (2025)

Master's degree (1 major) Mathematical Data Science (2025)

| Module  | Module title Abbreviation  |  |                            |  |                        |               |
|---|--|--|----------------------------|--|------------------------|---------------|
| Advanc  | Advanced Programming 10-I=APR-161-m01  |  |                            |  |                        |               |
| Module  | e coord  | inator   |                            | Module offered by  |                        |               |
| holder  | of the (   | Chair of Computer Scier                            | nce II                     | Institute of Comput  | er Science             |               |
| ECTS  | Metho  | od of grading                                      | Only after succ. cor       | npl. of module(s)  |                        |               |
| 5   | ;  | rical grade  |                            |  |                        |               |
| Duratio   | n  | Module level                                       | Other prerequisites        | j  |                        |               |
| 1 seme  | 1 semester graduate  |  |                            |  |                        |               |
| Conten  | ts   |  |                            |  |                        |               |
| With th   | e know   | ledge of basic program                             | ming, taught in introd     | uctory lectures, it is p                                       | oossible to realize si | impler pro-   |
|   |  | complex problems are                               |                            |  |                        |               |
|   |  | licates occur. In this lea                         |                            |  |                        |               |
| de a se<br>cussed   |  | structure. Also, further                           | topics in the areas of s   | software security and  | parallel programmi     | ng are dis-   |
|   |  | -!   |                            |  |                        |               |
|   |  | ning outcomes                                      |                            |  |                        |               |
|   |  | advanced programmi                                 |                            |  |                        |               |
|   |  | nted in multiple langua<br>1g concepts are introdu |                            |  |                        |               |
| sing.   | 00005511   |  |                            |  |                        | fuller proces |
|   | <b>s</b> (type   | , number of weekly con                             | tact hours, language –     | - if other than Germa  | n)                     |               |
| V (2) +   | Ü (2)  |  |                            |  |                        |               |
| Metho   | d of ass   | essment (type, scope,                              | <br>language — if other th | an German, examina   | tion offered — if not  | everv seme-   |
|   |  | on on whether module                               |                            |  |                        | , ,           |
| written   | exami  | nation (approx. 60 to 12                           | 20 minutes).               |  |                        |               |
|   |  | by the lecturer at the be                          |                            | the written examina  | tion may be replace    | d by an oral  |
|   |  | f one candidate each (                             | approx. 20 minutes) or     | r an oral examination  | in groups of 2 cand    | idates (ap-   |
|   |  | es per candidate).                                 | d / a « En aliab           |  |                        |               |
| credita   | •  | ssessment: German an<br>bonus                      | a/or English               |  |                        |               |
| Allocat   |  |  |                            |  |                        |               |
| Allocal   |  | Jaces  |                            |  |                        |               |
|   |  |  |                            |  |                        |               |
|   |  | ormation   |                            |  |                        |               |
| Focuse<br>SE,IS,L   |  | able for students of the<br>ES,GE                  | Master's programme I       | nformatik (Computer  | Science, 120 ECTS      | credits):     |
| Worklo  |  | ·  |                            |  |                        |               |
| 150 h   |  |  |                            |  |                        |               |
| -   | ng quel  | 0  |                            |  |                        |               |
| Teachi  | ig cycl  |  |                            |  |                        |               |
| <br>Doforro   | d to in  | IPOL (ovamination to                               | rulations for teaching     | dogroo programmas)   |                        |               |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)                            |  |  |                            |  |                        |               |
| Module appears in   |  |  |                            |  |                        |               |
| Master's degree (1 major) Computer Science (2016)   |  |  |                            |  |                        |               |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016)               |  |  |                            |  |                        |               |
| Master's degree (1 major) Mathematics (2016)<br>Master's degree (1 major) Computational Mathematics (2016)      |  |  |                            |  |                        |               |
| Master's degree (1 major) Computational Mathematics (2016)<br>Master's degree (1 major) Computer Science (2017) |  |  |                            |  |                        |               |
|   | Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018) |  |                            |  |                        |               |
|   | -  | ee (1 major) Computatio                            |                            | .9)  |                        |               |
|   | -  | ee (1 major) Mathemati                             |                            |  |                        |               |
| Master's wi   | ith 1 majoı  | Computer Science (2018)                            |                            | urg • generated 19-Apr-2025 •<br>ord Master (120 ECTS) Informa |                        | page 42 / 140 |
|   |  |  | ieg. uaid lett             |  | LIN 2010               |               |

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020)

| Module   | e title  |   |                        |                       | Abbreviation  |
|--|--|---|------------------------|-----------------------|---|
| Automa   | Automata Theory 10-I=AUT-161-m01   |   |                        |                       |   |
| Module   | e coord  | inator  |                        | Module offered by     |   |
| Dean o   | f Studi  | es Informatik (Computer S                               | Science)               | Institute of Comput   | er Science  |
| ECTS   | Metho  | od of grading   | Only after succ. con   | npl. of module(s)     |   |
| 5  | nume   | rical grade   |                        |                       |   |
| Duratio  | on   | Module level  | Other prerequisites    |                       |   |
| 1 seme   | ster   | graduate  |                        |                       |   |
| Conten   | Its  |   |                        |                       |   |
| words,   | langua   |   | nonoids, syntactic mo  | onoid, predicate logi | ations, predicate logic with<br>cal and algebraic characterisati-                                       |
| Intende  | ed lear  | ning outcomes   |                        |                       |   |
| ges, sta   | ar-free<br>ds, synt  | languages, natural equiva<br>tactic monoid, predicate l | alence relations, pred | dicate logic with wor | finite automata, regular langua-<br>ds, language acceptance through<br>regular and star-free languages, |
| Course   | <b>s</b> (type   | , number of weekly conta                                | ct hours, language –   | - if other than Germa | in)   |
| V (2) +  | Ü (2)  |   |                        |                       |   |
| W(2) + 0 (2)         Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)         written examination (approx. 60 to 120 minutes).         If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).         Language of assessment: German and/or English creditable for bonus         Allocation of places            Additional information         Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, IT, ES, HCI, GE |  |   |                        |                       |   |
| Worklo   | ad   |   |                        |                       |   |
| 150 h  |  |   |                        |                       |   |
| Teachi   | ng cycl  | e   |                        |                       |   |
|  |  |   |                        |                       |   |
| Referre  | ed to in   | LPOI (examination regu                                  | lations for teaching-o | degree programmes)    |   |
|  |  |   |                        |                       |   |
| Module appears in  |  |   |                        |                       |   |
| Master<br>Master<br>Master<br>Supple<br>Master<br>Master   | Module appears in<br>Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016)<br>Master's degree (1 major) Computational Mathematics (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019) |   |                        |                       |   |



Master's degree (1 major) Mathematics (2019)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Module title Abbreviation  |  |   |                         |   |                       |               |
|--|--|---|-------------------------|---|-----------------------|---------------|
| Avionio  | s Syste  | ems   |                         |   | 10-I=AVS-161-m01      |               |
| Module   | e coord  | inator  |                         | Module offered by   |                       |               |
| holder   | of the (   | Chair of Computer Scien   | ce VIII                 | Institute of Comput   | er Science            |               |
| ECTS   |  | od of grading   | Only after succ. con    | · · ·   |                       |               |
| 5  |  | rical grade   |                         | 1   |                       |               |
| Duratio  | on l   | Module level  | Other prerequisites     |   |                       |               |
| 1 seme   |  | graduate  |                         |   |                       |               |
| Conten   | its  | •   | 1                       |   |                       |               |
| commu  | unicatio   | <i>ionik-Systeme</i> (Avionics<br>n of airplanes and sate<br>sors and actuators, 5. s | llites: 1. software mod | ule and the software  |                       |               |
|  |  | ning outcomes   |                         | •   |                       |               |
| At the   | end of t   | he course, the students<br>They should be able to                                     |                         |   |                       |               |
| Course   | s (type.   | , number of weekly cont   | act hours, language –   | - if other than Germa   | n)                    |               |
| V (2) +  |  |   |                         |   |                       |               |
| Metho  | d of ass   | essment (type, scope, l<br>on on whether module                                       |                         |   | tion offered — if not | every seme-   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus |  |   |                         |   |                       |               |
|  | ion of p   |   |                         |   |                       |               |
|  | <u> </u>   |   |                         |   |                       |               |
| Additio  | onal info  | ormation  |                         |   |                       |               |
| Focuse<br>ES,LR  | s availa   | able for students of the  | Master's programme l    | nformatik (Computer   | Science, 120 ECTS o   | credits):     |
| Worklo   | ad   |   | _                       |   |                       |               |
| 150 h  |  |   |                         |   |                       |               |
|  | ng cycl  | •   | _                       |   |                       |               |
| Teacin   | ng cycl  | e   |                         |   |                       |               |
|  |  |   |                         |   |                       |               |
| Referre  | ed to in   | LPOI (examination reg   | ulations for teaching-  | degree programmes)  |                       |               |
|  |  |   |                         |   |                       |               |
|  | e appea  |   |                         |   |                       |               |
|  | -  | ee (1 major) Computer S   |                         |   |                       |               |
| Master's degree (1 major) Mathematics (2016)   |  |   |                         |   |                       |               |
| Master's degree (1 major) Computational Mathematics (2016)<br>Master's teaching degree Cympasium MINT Teacher Education PLUS - Elite Network Pavaria (ENP) (2016)  |  |   |                         |   |                       |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)   |  |   |                         |   |                       |               |
|  |  | •   |                         | Network Bavafia (EN   | D) (2010)             |               |
|  | Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018) |   |                         |   |                       |               |
|  | -  |   |                         | 0)  |                       |               |
|  | -  | ee (1 major) Computatio   |                         | 9)  |                       |               |
|  | -  | ee (1 major) Mathematio<br>ning degree Gymnasium                                      | -                       | ion PLUS Flite Notw   | ork Bayaria (ENR) (a  | 020)          |
| master   | 5 ieau   | ing degree dynnasiun  | mini reacher Euucal     | ion i 200, cute NetW  | un davalla (END) (20  | 020)          |
| Master's w   | ith 1 major  | Computer Science (2018)   |                         | ırg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                       | page 46 / 140 |

### Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Computer Science (2025)

| Module title Abbreviation  |  |  |                        |  |                       |                |
|--|--|--|------------------------|--|-----------------------|----------------|
| Compu  | Computability Theory   |  |                        |  |                       |                |
| Modul  | e coord  | inator   |                        | Module offered by  | <u> </u>              |                |
|  |  |  | Colouro)               |  |                       |                |
|  | 1  | es Informatik (Computer                          |                        | Institute of Comput  | er Science            |                |
| ECTS   | 1  | od of grading                                    | Only after succ. con   | npl. of module(s)  |                       |                |
| 5  | · · · · ·  | rical grade                                      |                        |  |                       |                |
| Duratio  |  | Module level                                     | Other prerequisites    |  |                       |                |
| 1 seme   |  | graduate   |                        |  |                       |                |
| Conten   |  |  |                        |  |                       | -              |
|  | Gödel numbering, computable functions, decidable and countable sets, halting problem, m-reducibility, creative and productive sets, relative computability, Turing reduction, countable degrees, arithmetic hierarchy. |  |                        |  |                       |                |
| Intend   | ed learr   | ning outcomes                                    |                        |  |                       |                |
| The stu  | udents r   | oossess a fundamental                            | and applicable knowl   | edge in the areas of   | Gödel numbers, cou    | ntable functi- |
| ons, de  | ecidable   | e and countable sets, has reduction, countable d | alting problem, m-red  | ucibility, creative and  |                       |                |
|  |  | , number of weekly cont                          |                        | •  | n)                    |                |
| V (2) +  |  | , number of weekty cont                          |                        | n other than defind  |                       |                |
| . ,  |  |  | ;fthth                 |  | tion offered if not   |                |
|  |  | essment (type, scope, l<br>on on whether module  |                        |  | tion offered — if not | every seme-    |
|  |  | nation (approx. 60 to 12                         |                        |  |                       |                |
|  |  | by the lecturer at the be                        |                        | the written examina  | tion may be replaced  | d by an oral   |
|  |  | f one candidate each (a                          |                        |  |                       |                |
|  |  | es per candidate).                               |                        |  | 5                     |                |
|  |  | ssessment: German and                            | d/or English           |  |                       |                |
| credita  | ble for  | bonus  |                        |  |                       |                |
| Allocat  | tion of p  | olaces   |                        |  |                       |                |
|  |  |  |                        |  |                       |                |
| Additio  | onal info  | ormation   |                        |  |                       |                |
| 1  | es availa<br>IT,IS,GE  | able for students of the                         | Master's programme I   | nformatik (Computer  | Science, 120 ECTS o   | credits):      |
| Worklo   |  |  |                        |  |                       |                |
| 150 h  | /uu  |  |                        |  |                       |                |
|  |  |  |                        |  |                       |                |
| Teachi   | ng cycl  | 8  |                        |  |                       |                |
|  |  |  |                        |  |                       |                |
| Referre  | ed to in   | LPO I (examination reg                           | ulations for teaching- | degree programmes)   |                       |                |
|  |  |  |                        |  |                       |                |
| Module   | e appea  | irs in   |                        |  |                       |                |
| Master   | 's degre   | ee (1 major) Computer S                          | cience (2016)          |  |                       |                |
| 1  | -  | ee (1 major) Mathematio                          |                        |  |                       |                |
| Master's degree (1 major) Computational Mathematics (2016)   |  |  |                        |  |                       |                |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |  |  |                        |  |                       |                |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)               |  |  |                        |  |                       |                |
| 1  | -  | ee (1 major) Computer S                          |                        |  |                       |                |
|  | -  | ee (1 major) Computer S                          |                        | 、<br>、   |                       |                |
|  | -  | ee (1 major) Computatio                          |                        | .9)  |                       |                |
| 1  | -  | ee (1 major) Mathematic                          | -                      |  |                       |                |
| Master   | 's teach   | ning degree Gymnasium                            | MINT Teacher Educat    | ion PLUS, Elite Netwo  | ork Bavaria (ENB) (20 | 020)           |
| Master's w   | rith 1 major   | Computer Science (2018)                          |                        | urg • generated 19-Apr-2025 •<br>ord Master (120 ECTS) Informa |                       | page 48 / 140  |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Module title  |   |                         | Abbreviation                      |  |  |
|---|---|-------------------------|-----------------------------------|--|--|
| Operating Systems   |   |                         | 10-l=BS-161-m01                   |  |  |
| Module coordinator  |   | Module offered by       |                                   |  |  |
| holder of the Chair of Computer Science   | e II  | Institute of Comput     | er Science                        |  |  |
| ECTS Method of grading  | Only after succ. com                          | pl. of module(s)        |                                   |  |  |
| 5 numerical grade   |   |                         |                                   |  |  |
| Duration Module level   | Other prerequisites                           |                         |                                   |  |  |
| 1 semester graduate   | 1 semester graduate                           |                         |                                   |  |  |
| Contents  |   |                         |                                   |  |  |
| Batch, time sharing, real-time virtual n<br>schedulers, process synchronisation,<br>nagement, segmentation, paging, file<br>organisation, basics of MS operating s  | semaphores, monitor<br>systems, interfaces, d | s, critical regions, de | eadlocks, dynamic memory ma-      |  |  |
| Intended learning outcomes  |   |                         |                                   |  |  |
| The students possess knowledge and  | practical skills in buil                      | ding and using esse     | ntial parts of operating systems. |  |  |
| Courses (type, number of weekly conta   | act hours, language —                         | · if other than Germa   | n)                                |  |  |
| V (2) + Ü (2)   |   |                         |                                   |  |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-         ster, information on whether module can be chosen to earn a bonus)         written examination (approx. 60 to 120 minutes).         If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral         examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).         Separate written examination for Master's students.         Language of assessment: German and/or English         creditable for bonus         Allocation of places            Additional information         Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):         SE,ES,GE |   |                         |                                   |  |  |
| Workload  | -   |                         |                                   |  |  |
| 150 h   |   |                         |                                   |  |  |
| Teaching cycle  |   |                         |                                   |  |  |
|   |   |                         |                                   |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |   |                         |                                   |  |  |
|   |   |                         |                                   |  |  |
| Module appears in   |   |                         |                                   |  |  |
| Master's degree (1 major) Computer So<br>Master's degree (1 major) Computer So<br>Master's degree (1 major) Computer So   | cience (2017)                                 |                         |                                   |  |  |

| Modul  | e title  |  |   |   | Abbreviation          |               |
|--|--|--|---|---|-----------------------|---------------|
| Compi  | Compiler Construction 10-I=CB-161-m01  |  |   |   |                       |               |
| Modul  | e coord  | inator   |   | Module offered by   |                       |               |
| holder   | of the (   | Chair of Computer Scie                           | nce II  | Institute of Comput   | er Science            |               |
| ECTS   |  | od of grading                                    | Only after succ. con                            |   |                       |               |
| 5  | · · · · · · · · · · · · · · · · · · ·  | rical grade                                      |   | 1   |                       |               |
| Duratio  | on   | Module level                                     | Other prerequisites                             |   |                       |               |
| 1 seme   |  | graduate   |   |   |                       |               |
| Conter   | its  | -  |   |   |                       |               |
| Lexical  | analys   | is, syntactic analysis, s                        | semantics, compiler ge                          | nerators, code gener  | ators, code optimisa  | ation.        |
| Intend   | ed learr   | ning outcomes                                    |   |   |                       |               |
| They a   | re able  |  | the formal description of ions between them wit |   |                       |               |
| Course   | <b>s</b> (type,  | , number of weekly cor                           | itact hours, language –                         | - if other than Germa   | n)                    |               |
| V (2) +  | Ü (2)  |  |   |   |                       |               |
|  |  |  | language — if other the can be chosen to earn   |   | tion offered — if not | every seme-   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus |  |  |   |   |                       |               |
| Allocat  | ion of p   | olaces   |   |   |                       |               |
|  |  |  |   |   |                       |               |
| Additio  | onal info  | ormation   |   |   |                       |               |
| Focuse<br>SE,IT,IS   |  | able for students of the                         | Master's programme I                            | nformatik (Computer   | Science, 120 ECTS o   | credits):     |
| Worklo   | · · · · · · · · · · · · · · · · · · ·  |  |   |   |                       |               |
| 150 h  |  |  |   |   |                       |               |
|  | ng cycl  | 9  |   |   |                       |               |
|  | 0 . 7  | -  |   |   |                       |               |
| Referre  | ed to in   | LPOI (examination re                             | gulations for teaching-                         | degree programmes)  |                       |               |
|  |  |  |   |   |                       |               |
| Modul  | e appea  | irs in   |   |   |                       |               |
| Master   | 's degre   | ee (1 major) Computer                            | Science (2016)                                  |   |                       |               |
| Master   | 's degre   | ee (1 major) Mathemat                            | ics (2016)                                      |   |                       |               |
| Master's degree (1 major) Computational Mathematics (2016)   |  |  |   |   |                       |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)   |  |  |   |   |                       |               |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)   |  |  |   |   |                       |               |
| Master's degree (1 major) Computer Science (2017)  |  |  |   |   |                       |               |
| Master's degree (1 major) Computer Science (2018)  |  |  |   |   |                       |               |
|  | Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019) |  |   |   |                       |               |
|  | -  | ee (1 major) Mathemat<br>ee (1 major) Informatio | -   |   |                       |               |
|  | -  |  | n MINT Teacher Educat                           | ion PLUS, Elite Netwo   | ork Bavaria (ENB) (20 | 020)          |
| Master's w   | ith 1 major  | Computer Science (2018)                          |   | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                       | page 51 / 140 |

### Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

| Module title Abbreviation   |  |                                   |   |  |                        |               |
|---|--|-----------------------------------|---|--|------------------------|---------------|
| Databa  | Databases 10-I=DB-161-m01                              |                                   |   |  |                        |               |
| Modul   | e coord  | inator                            |   | Module offered by  |                        |               |
|   |  |                                   | or Science)                                     |  |                        |               |
|   |  | es Informatik (Compute            |   | Institute of Comput  | ter Science            |               |
| ECTS  |  | od of grading<br>rical grade      | Only after succ. cor                            | npi. of module(s)  |                        |               |
| 5   | ·  |                                   |   |  |                        |               |
| Duration 1 seme   |  | Module level graduate             | Other prerequisites                             | 5  |                        |               |
| Conter  |  | glauuale                          |   |  |                        |               |
|   |  | abra and complex SOL              |   | planning and norma   | l forms XML data m     | odolling      |
|   | -  | anagement.                        |   |  | tionins, XME data m    | ouening,      |
| Intend  | ed learı   | ning outcomes                     |   |  |                        |               |
|   |  | oossess knowledge ab<br>g in XML. | out data modelling and                          | d queries in SQL, trar                                       | nsactions as well as   | about easy    |
| Course  | es (type   | , number of weekly cor            | itact hours, language –                         | – if other than Germa  | an)                    |               |
| V (2) +   | Ü (2)  |                                   |   |  |                        |               |
|   |  |                                   | language — if other th<br>can be chosen to earn |  | ition offered — if not | every seme-   |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Separate written examination for Master's students.<br>Language of assessment: German and/or English |  |                                   |   |  |                        |               |
|   | ble for<br>tion of p                                   |                                   |   |  |                        |               |
| Alloca  |  | naces                             |   |  |                        |               |
| Additio   | onal inf   | ormation                          |   |  |                        |               |
|   | es availa  |                                   | Master's programme I                            | nformatik (Compute   | r Science, 120 ECTS    | credits): SE, |
| Worklo  |  |                                   |   |  |                        |               |
|   | <u>au</u>  |                                   |   |  |                        |               |
| 150 h   |  |                                   |   |  |                        |               |
| Teachi  | ng cycl  | e                                 |   |  |                        |               |
|   |  |                                   |   |  |                        |               |
| Referre   | ed to in   | LPOI (examination re              | gulations for teaching-                         | degree programmes)   |                        |               |
|   |  |                                   |   |  |                        |               |
|   | e appea  |                                   |   |  |                        |               |
|   | -  | ee (1 major) Computer             |   |  |                        |               |
| Master's degree (1 major) Physics (2016)  |  |                                   |   |  |                        |               |
| Master's degree (1 major) Digital Humanities (2016)   |  |                                   |   |  |                        |               |
| Master's degree (1 major) Computer Science (2017)   |  |                                   |   |  |                        |               |
| Master's degree (1 major) Computer Science (2018)   |  |                                   |   |  |                        |               |
| Master's degree (1 major) Physics (2020)  |  |                                   |   |  |                        |               |
|   | Master's degree (1 major) Physics International (2020) |                                   |   |  |                        |               |
|   | Master's degree (1 major) Quantum Engineering (2020)   |                                   |   |  |                        |               |
|   | -  | ee (1 major) Quantum I            |   |  |                        |               |
| Master  | r's degre  | ee (1 major) Physics In           | ernational (2024)                               |  |                        |               |
| Master's w  | vith 1 major   | Computer Science (2018)           |   | urg • generated 19-Apr-2025<br>ord Master (120 ECTS) Informa |                        | page 53 / 140 |

| Module   | e title   |   |                        |                       | Abbreviation                          |
|--|---|---|------------------------|-----------------------|---------------------------------------|
| Databa   | ISES 2  |   |                        |                       | 10-I=DB2-161-m01                      |
| Module   | e coord   | inator  |                        | Module offered by     |                                       |
| Dean o   | f Studi   | es Informatik (Computer S                     | Science)               | Institute of Comput   | er Science                            |
| ECTS   |   | od of grading                                 | Only after succ. con   | npl. of module(s)     |                                       |
| 5  | nume  | rical grade                                   |                        |                       |                                       |
| Duratio  |   | Module level                                  | Other prerequisites    |                       |                                       |
| 1 seme   | ster  | graduate                                      |                        |                       |                                       |
| Conten   | ts  |   |                        |                       |                                       |
| Data w   | arehou  | ses and data mining; wel                      | b databases; introdu   | ction to Datalog.     |                                       |
| Intende  | ed lear   | ning outcomes                                 |                        |                       |                                       |
| The stu  | idents l  | have advanced knowledg                        | e about relational da  | tabases, XML and d    | ata mining.                           |
| Course   | <b>s</b> (type  | , number of weekly conta                      | ct hours, language –   | - if other than Germa | n)                                    |
| V (2) +  | Ü (2)   |   |                        |                       |                                       |
|  |   | sessment (type, scope, la                     | nguage — if other tha  | an German, examina    | tion offered — if not every seme-     |
|  |   | ion on whether module ca                      |                        |                       | · · · · · · · · · · · · · · · · · · · |
| written  | exami   | nation (approx. 60 to 120                     | minutes).              |                       |                                       |
|  |   |   |                        |                       | tion may be replaced by an oral       |
|  |   |   | prox. 20 minutes) or   | an oral examination   | in groups of 2 candidates (ap-        |
|  |   | tes per candidate).<br>ssessment: German and, | /or English            |                       |                                       |
| credita  |   |   |                        |                       |                                       |
| Allocat  | ion of p  | olaces  |                        |                       |                                       |
|  |   |   |                        |                       |                                       |
| Additio  | onal inf  | ormation                                      |                        |                       |                                       |
| Focuse<br>IS, HCI.   |   | able for students of the N                    | laster's programme l   | nformatik (Computer   | Science, 120 ECTS credits): SE,       |
| Worklo   |   |   |                        |                       |                                       |
| 150 h  |   |   | ,                      |                       |                                       |
| Teachi   | ng cycl   | e   |                        |                       |                                       |
|  |   |   |                        |                       |                                       |
| Referre  | ed to in  | LPOI (examination regu                        | lations for teaching-o | degree programmes)    |                                       |
|  |   |   |                        |                       |                                       |
| Module   | e appea   | ars in  |                        |                       |                                       |
| Master   | 's degr   | ee (1 major) Computer Sc                      | ience (2016)           |                       |                                       |
| Master   | Master's degree (1 major) Business Information Systems (2016) |   |                        |                       |                                       |
|  | Master's degree (1 major) Computer Science (2017)             |   |                        |                       |                                       |
|  | -   | ee (1 major) Computer Sc                      |                        |                       |                                       |
|  | -   | ee (1 major) Information S                    |                        |                       |                                       |
|  |   | hing degree Gymnasium I                       |                        |                       |                                       |
|  |   | ry course MINT Teacher Ed                     |                        |                       | B) (2020)                             |
|  |   | ee (1 major) Aerospace Co                     |                        |                       |                                       |
| Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020) |   |   |                        |                       |                                       |

| Deductive Databases       10-I=DDB-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)         5       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs.         Intended learning outcomes          The students have fundamental and practicable knowledge about Datalog (including negation).         Threy are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t. their equivalence and other properties.         Courses (type, number of weekly contact hours, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)         Written examination of one candidate each (approx. 20 minutes)       If announced by the lecturer at the beginning of the course, the written examination in groups of z candidates (approx. 15 minutes per candidate).         Language of assessment: (cerman and/or English creditable for bonus          Additional information       <  | Modul                                | Module title Abbreviation  |  |                        |                                       | Abbreviation                       |
|---|--------------------------------------|--|--|------------------------|---------------------------------------|------------------------------------|
| Dean of Studies Informatik (Computer Science)         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         graduate            Contents         Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs.           Intendel learning outcomes            Courses (type, number of weekly contact hours, language – if other than German)         V (2) + 0 (2)           Method of assessment (type, scope, language – if other than German, examination offered – if not every semester, information on whether module can be chosen to earn a bonus)           written examination of one candidate each (approx. 20 minutes) or an oral examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of z candidates (approx. 20 minutes) or an oral examination in groups of z candidates (approx. 35 minutes) or an oral examination in groups of z candidates (approx. 35 minutes) or an oral examination in groups of z candidates (approx. 35 minutes) or an oral examination in groups of z candidates (approx. 35 minutes) or an oral examination in groups of z candidates (approx. 35 minutes) or an oral examination ingroups of z candidates (approx. 35 min  | Deduc                                | tive Dat   | abases   |                        |                                       | 10-l=DDB-172-m01                   |
| ECTS         Method of grading         Only after succ. compl. of module(s)           5         numerical grade            Duration         Module level         Other prerequisites           1 semester         graduate            Contents           Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs.           Intended learning outcomes            The students have fundamental and practicable knowledge about Datalog (including negation).            They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t.            Het students have fundamental and practicable knowledge about Datalog (including negation).            They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t.            Het students have fundamental and practicable knowledge about Datalog (including negation).            The students do method for assessment (type, scope, language — if other than German)         V (2) + 0 (2)           Method of assessment (type, scope, language — if other than German)            If anounced by the lecturer at the beginning of the course,   | Modul                                | e coord  | inator   |                        | Module offered by                     |                                    |
| ECTS         Method of grading         Only after succ. compl. of module(s)           5         numerical grade            Duration         Module level         Other prerequisites           1 semester         graduate            Contents           Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs.           Intended learning outcomes            The students have fundamental and practicable knowledge about Datalog (including negation).            They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t.            Het students have fundamental and practicable knowledge about Datalog (including negation).            They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t.            Het students have fundamental and practicable knowledge about Datalog (including negation).            The students do method for assessment (type, scope, language — if other than German)         V (2) + 0 (2)           Method of assessment (type, scope, language — if other than German)            If anounced by the lecturer at the beginning of the course,   | Dean c                               | of Studio  | es Informatik (Computer S  | Science)               | Institute of Comput                   | er Science                         |
| 5       numerical grade   |                                      | 1  |  |                        | · · · · · · · · · · · · · · · · · · · |                                    |
| 1 semester       graduate          Contents       Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs.         Intended learning outcomes       Intended learning outcomes         The students have fundamental and practicable knowledge about Datalog (including negation).       The students have fundamental and practicable knowledge about Datalog (including negation).         They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t. their equivalence and other properties.         Courses (type, number of weekly contact hours, language — if other than German)         V (2) + 0 (2)         Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)         written examination (approx. 60 to 120 minutes).         If announced by the lecture rat the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 35 minutes per candidate).         Language of assessment: German and/or English creditable for bonus       Courses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.         Workload       Iso h       Courses available   | 5                                    | nume   | rical grade  |                        | -                                     |                                    |
| 1 semester       graduate          Contents          Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs.         Intended learning outcomes          The students have fundamental and practicable knowledge about Datalog (including negation).       The students have fundamental and practicable knowledge about Datalog and to compare existing programs w.r.t. their equivalence and other properties.         Courses (type, number of weekly contact hours, language — if other than German)       V (2) + 0 (2)         Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)         written examination (approx. 60 to 120 minutes).       If announced by the lecture at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 25 minutes per candidate).         Language of assessment: German and/or English creditable for bonus          Additional information          Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.         Workload          150 h  | Durati                               | on   | Module level   | Other prerequisites    |                                       |                                    |
| Syntax and semantics of definite and normal logic programs; Model, proof, and fixpoint theory; Connection to relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs. Intended learning outcomes The students have fundamental and practicable knowledge about Datalog (including negation). They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t. their equivalence and other properties. Courses (type, number of weekly contact hours, language — if other than German) V (2) + Û (2) Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places  | 1 seme                               | ester  | graduate   |                        |                                       |                                    |
| relational databases; Evaluation methods for Datalog; Negation and stratification; Structural properties of logic programs: recursion, equivalence, transformation; Outlook on disjunctive logic programs. Intendel learning outcomes The students have fundamental and practicable knowledge about Datalog (including negation). They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t. their equivalence and other properties. Courses (type, number of weekly contact hours, language — if other than German) V (2) + Û (2) Method of assessment (type, scope, language — if other than German, examination offered — if not every seme- ster, information on whether module can be chosen to earn a bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Morkload I50 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018)   | Conter                               | nts  |  |                        |                                       |                                    |
| The students have fundamental and practicable knowledge about Datalog (including negation).<br>They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t.<br>their equivalence and other properties.<br><b>Courses</b> (type, number of weekly contact hours, language — if other than German)<br>V (a) + Ü (a)<br><b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 6o to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus<br><b>Allocation of places</b><br><br><b>Additional information</b><br>Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,<br>SE, IT, IS.<br><b>Workload</b><br>150 h<br><b>Teaching cycle</b><br><br><b>Module appears in</b><br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Attended Artificial Intelligence (xtAl) (2020) | relatio                              | nal data   | abases; Evaluation metho   | ods for Datalog; Nega  | tion and stratificatio                | on; Structural properties of logic |
| They are able to compactly implement declarative programs in Datalog and to compare existing programs w.r.t. their equivalence and other properties. Courses (type, number of weekly contact hours, language — if other than German) V (2) + Ü (2) Method of assessment (type, scope, language — if other than German, examination offered — if not every seme- ster, information on whether module can be chosen to earn a bonus) written examination (approx. 6o to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS. Workload 150 h Teaching cycle Referred to in LPO 1 (examination regulations for teaching-degree programmes) Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  | Intend                               | ed lear  | ning outcomes  |                        |                                       |                                    |
| V (z) + Ü (z)  Method of assessment (type, scope, language — if other than German, examination offered — if not every seme- ster, information on whether module can be chosen to earn a bonus)  written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus  Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.  Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in Master's degree (1 major) Computer Science (2017) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   | They a                               | re able  | to compactly implement   | declarative programs   |                                       |                                    |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus<br>Allocation of places<br><br>Additional information<br>Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,<br>SE, IT, IS.<br>Workload<br>150 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   | Course                               | <b>es</b> (type  | , number of weekly conta   | ct hours, language —   | if other than Germa                   | n)                                 |
| ster, information on whether module can be chosen to earn a bonus) written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap- prox. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS. Workload 150 h Teaching cycle Referred to in LPO 1 (examination regulations for teaching-degree programmes) Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018) Master's degree (1 major) eXtended Artificial Intelligence (xtAI) (2020)   | V (2) +                              | Ü (2)  |  |                        |                                       |                                    |
| If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).<br>Language of assessment: German and/or English creditable for bonus  Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS. Workload 150 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2017) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   |                                      |  |  |                        |                                       | tion offered — if not every seme-  |
| Additional information         Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.         Workload         150 h         Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Master's degree (1 major) Computer Science (2017)         Master's degree (1 major) Computer Science (2018)         Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   | examir<br>prox. 1<br>Langua          | nation c<br>5 minut<br>age of a  | of one candidate each (ap<br>res per candidate).<br>ssessment: German and/ | prox. 20 minutes) or   |                                       |                                    |
| Additional information         Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.         Workload         150 h         Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Master's degree (1 major) Computer Science (2017)         Master's degree (1 major) Computer Science (2018)         Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   | Alloca                               | tion of p  | olaces   |                        |                                       |                                    |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT,<br>SE, IT, IS.<br>Workload<br>150 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   |                                      |  |  |                        |                                       |                                    |
| SE, IT, IS.<br>Workload<br>150 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  | Additio                              | onal inf   | ormation   |                        |                                       |                                    |
| Workload         150 h         Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Master's degree (1 major) Computer Science (2017)         Master's degree (1 major) Computer Science (2018)         Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  |                                      |  | able for students of the M   | laster's programme li  | nformatik (Computer                   | Science, 120 ECTS credits): AT,    |
| Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Master's degree (1 major) Computer Science (2017)         Master's degree (1 major) Computer Science (2018)         Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   | Worklo                               | bad  |  |                        |                                       |                                    |
| Teaching cycle            Referred to in LPO I (examination regulations for teaching-degree programmes)            Module appears in         Master's degree (1 major) Computer Science (2017)         Master's degree (1 major) Computer Science (2018)         Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)         Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   | 150 h                                |  |  |                        |                                       |                                    |
| <br>Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  | Teachi                               | ng cycl  | e  |                        |                                       |                                    |
| <br>Module appears in Master's degree (1 major) Computer Science (2017) Master's degree (1 major) Computer Science (2018) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  |                                      |  |  |                        |                                       |                                    |
| Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  | Referre                              | ed to in   | LPOI (examination regu   | lations for teaching-o | legree programmes)                    |                                    |
| Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)  |                                      |  |  |                        |                                       |                                    |
| Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)   | Module appears in                    |  |  |                        |                                       |                                    |
|   | Master<br>Master<br>Supple<br>Master | Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020) |  |                        |                                       |                                    |

| Module title  |   |   | Abbreviation   |  |
|---|---|---|--|--|
| Data Mining 10-I=DM-161-m01   |   |   |  |  |
| Module coordinator  |   | Module offered by                               |  |  |
| Dean of Studies Informatik (Computer S  | Science)  | Institute of Comput                             | er Science   |  |
|   | Only after succ. com                                    | pl. of module(s)                                |  |  |
| 5 numerical grade   |   |   |  |  |
| i i   | Other prerequisites                                     |   |  |  |
| 1 semester graduate   |   |   |  |  |
| Contents  |   |   |  |  |
| Foundations in the following areas: defi<br>model, relationship to data warehouse<br>methods (cluster- and association meth<br>SVM), learning methods for special data  | and OLAP data prep<br>nods), supervised lea             | rocessing, data visua<br>arning (e. g. Bayes cl | alisation, unsupervised learning                               |  |
| Intended learning outcomes  |   |   |  |  |
| The students possess a theoretical and<br>ta mining and machine learning. They a<br>the knowledge acquired in this course a<br>or implementation of data mining algori  | re able to solve prac<br>and by using the KDE<br>ithms. | tical knowledge disc<br>) process. They have    | overy problems with the help of acquired experience in the use |  |
| Courses (type, number of weekly contac  | ct hours, language —                                    | · if other than Germa                           | n)   |  |
| V (2) + Ü (2)   |   |   |  |  |
| <b>Method of assessment</b> (type, scope, lar ster, information on whether module ca  |   |   | tion offered — if not every seme-                              |  |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Separate written examination for Master's students.<br>Language of assessment: German and/or English<br>creditable for bonus |   |   |  |  |
| Allocation of places  |   |   |  |  |
|   |   |   |  |  |
| Additional information  |   |   |  |  |
| Focuses available for students of the Ma<br>IS, HCI, GE.  | aster's programme li                                    | nformatik (Computer                             | Science, 120 ECTS credits): IT,                                |  |
| Workload  |   |   |  |  |
| 150 h   |   |   |  |  |
| Teaching cycle  |   |   |  |  |
|   |   |   |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |   |   |  |  |
|   |   |   |  |  |
| Module appears in   |   |   |  |  |
| Master's degree (1 major) Computer Sci  | ence (2016)   |   |  |  |
| Master's degree (1 major) Digital Humar   |   |   |  |  |
| Master's degree (1 major) Computer Sci  |   |   |  |  |
| Master's degree (1 major) Computer Sci  | ence (2018)   |   |  |  |

| Module title   |  |  | Abbreviation                                      |   |                        |               |
|--|--|--|---|---|------------------------|---------------|
| E-Learning 10-I=EL-161-m01   |  |  |   |   |                        |               |
| Modul  | e coord  | inator   |   | Module offered by   | <u>I</u>               |               |
| holder   | of the (   | Chair of Computer Scier  | nce VI  | Institute of Comput   | ter Science            |               |
| ECTS   | <b>—</b>   | od of grading  | Only after succ. con                              | · · · · · ·   |                        |               |
| 5  |  | rical grade  |   |   |                        |               |
| Duratio  | ·  | Module level   | Other prerequisites                               |   |                        |               |
| 1 seme   |  | graduate   |   |   |                        |               |
| Conter   | nts  |  |   |   |                        |               |
| intellig   | gent tuto  | digms, learning system<br>pring systems, student<br>ve tutoring systems, co  | models, didactics, pro                            | blem-oriented learni  | ing and case-based t   | raining sy-   |
| Intend   | ed learı   | ning outcomes  |   |   |                        |               |
| The stu<br>plicatio  |  | oossess a theoretical a  | nd practical knowledge                            | e about eLearning an  | nd are able to assess  | possible ap-  |
| Course   | es (type   | , number of weekly con   | tact hours, language –                            | - if other than Germa   | an)                    |               |
| V (2) +  | Ü (2)  |  |   |   |                        |               |
|  |  | essment (type, scope, on on whether module   |   |   | ition offered — if not | every seme-   |
| lf anno<br>examir<br>prox. 1<br>Langua   | ounced l<br>nation o<br>5 minut  | nation (approx. 60 to 12<br>by the lecturer at the be<br>f one candidate each (<br>es per candidate).<br>ssessment: German an<br>bonus | eginning of the course,<br>approx. 20 minutes) or |   |                        |               |
| Allocat  | tion of p  | olaces   |   |   |                        |               |
|  |  |  |   |   |                        |               |
| Additio  | onal inf   | ormation   |   |   |                        |               |
|  | es availa<br>S,HCI,G   | able for students of the<br>E  | Master's programme I                              | nformatik (Compute  | r Science, 120 ECTS (  | credits):     |
| Worklo   | bad  |  |   |   |                        |               |
| 150 h  |  |  |   |   |                        |               |
|  | ng cycl  | 9  |   |   |                        |               |
| Teachi   | iis cyce   | •  |   |   |                        |               |
|  |  |  |   |   |                        |               |
| Referre  |  | LPOI (examination reg  | gulations for teaching-                           | degree programmes)  |                        |               |
| <br>Modul  | e appea  | rc in  |   |   |                        |               |
|  |  | ee (1 major) Computer S  | Science (2016)                                    |   |                        |               |
|  | -  |  |   |   |                        |               |
| Master's degree (1 major) Mathematics (2016)<br>Master's degree (1 major) Computational Mathematics (2016) |  |  |   |   |                        |               |
|  | Master's degree (1 major) Computational Mathematics (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |  |   |   |                        |               |
|  |  | y course MINT Teacher  |   |   |                        | 010)          |
|  |  | ee (1 major) Computer S  |   | litetiioni Buruna (En   | 2) (2010)              |               |
|  | -  | ee (1 major) Computer S  |   |   |                        |               |
|  | -  |  |   | 9)  |                        |               |
|  | Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019)   |  |   |   |                        |               |
|  | -  | ee (1 major) Media Corr  | -   |   |                        |               |
|  | _  |  |   |   |                        |               |
| master's W   | nui 1 majoi  | Computer Science (2018)  |   | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                        | page 57 / 140 |



Master's degree (1 major) Information Systems (2019)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Modul  | e title   |  |   |   | Abbreviation  |
|--|---|--|---|---|---|
| Desigr   | n of Plar   | etary Bases and Orl  | oital Stations  |   | 10-I=EPB-182-m01  |
| Modul  | e coord   | nator  |   | Module offered by   | <u> </u>  |
|  |   | Chair of Computer Sc   | ience VIII  | Institute of Compu  |   |
| ECTS   | -   | od of grading  | Only after succ. co   | · ·   |   |
| 10   |   | rical grade  |   |   |   |
| Durati   | <u> </u>  | Module level   | Other prerequisite  | <u>ا</u>  |   |
| 1 seme   |   | graduate   |   | .5  |   |
| Conter   | I   | 3  |   |   |   |
| planni<br>compo<br>se etc)<br>constr<br>produc<br>ly laye<br>Intend<br>The stu<br>le to a<br>suppo | ng of pla<br>onents li<br>The mo<br>uction a<br>ction, tra<br>d out ar<br>ed learn<br>udents g<br>nalyse t<br>rt of the | anetary bases. This with<br>ke satellites. The const important aspect<br>and operation scenar<br>ansport between ear<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>analyzed.<br>acquired knowledge | will train the planning of<br>ntent will be decided up<br>s like motivation, goals,<br>ios, planning of module<br>th and moon as well as<br>owledge about the plan<br>cts of planning, pose rec<br>e of methods they are ab | a very complex space<br>oon each semester (for<br>prerequisites, constru-<br>s and structures, life<br>mobility on the surfa<br>ning of planetary bas<br>guirements and consi<br>ole to create dedicate | cus on the special aspects of<br>ecraft apart from its individual<br>or example lunar base, mars ba-<br>raints, environment, localization,<br>support, energy, communication,<br>ce of the moon will be conceptua<br>es and orbital bases. They are ab<br>der the system design. With the<br>d tools and processes to support<br>anagement for the development of |
| planet   | ary base  | es and orbital station   |   | · ·   | - · · ·   |
| R (6)  |   | number of weekly e   |   | n other than defin  |   |
| ster, ir<br>projec<br>Each p<br>same t<br>Langua   | formati<br>t report<br>project is<br>topic. As<br>age of a  | on on whether modu<br>(10 to 15 pages) and<br>offered one time or<br>ssessment can, there<br>ssessment: German   | Ile can be chosen to ear<br>presentation of project<br>Ily. The project will not be<br>efore, only be offered for   | n a bonus)<br>(15 to 30 minutes)<br>be repeated; there wi<br>r the project offered i  | ation offered — if not every seme-<br>Il not be another project with the<br>n the respective semester.  |
| Alloca   | tion of p   | laces  |   |   |   |
|  |   |  |   |   |   |
| Additi   | onal info   | ormation   |   |   |   |
| Cf. Sec  | tion 3 S  |  | he Master's programme<br>ce 8 FSB (subject-specifi  | -   | er Science, 120 ECTS credits): LR.  |
| Worklo   | bad   |  |   |   |   |
| 300 h  |   |  |   |   |   |
| Teachi   | ing cycl  | 2  |   |   |   |
|  |   |  |   |   |   |
|  | ed to in  | LPOI (examination  | regulations for teaching  | -degree programmes  | )   |
| Referre  |   |  |   |   |   |
| Referre  |   |  |   |   |   |
|  | e appea   | rs in  |   |   |   |
| <br>Modul  | <b>e appea</b><br>r's degre   |  | er Science (2018)   |   |   |
| <br><b>Modul</b><br>Maste  | r's degre   | ee (1 major) Compute   |   |   |   |
| <br><b>Modul</b><br>Master<br>Master   | r's degre<br>r's degre  |  | er Science (2021)   |   |   |

| Module title  |  |  | Abbreviation          |   |  |
|---|--|--|-----------------------|---|--|
| Embedd  | Embedded Systems 10-I=ES-161-m01   |  |                       |   |  |
| Module coordinator  |  |  | Module offered by     |   |  |
| Dean of   | Studies Informatik (Computer   | Science)                                       | Institute of Comput   | er Science  |  |
|   | Method of grading  | Only after succ. con                           | npl. of module(s)     |   |  |
| 8   | numerical grade  |  |                       |   |  |
| Duration  |  | Other prerequisites                            |                       |   |  |
| 1 semes   | 5  |  |                       |   |  |
| Content   | S  |  |                       |   |  |
|   | , implementation planning sta  |  |                       | troller), verification of embedded<br>ms, hardware synthesis, softwa- |  |
| Intende   | d learning outcomes  |  |                       |   |  |
|   | dents are familiar with the tech<br>portant techniques for the mod<br>e. |  |                       |   |  |
| Courses   | (type, number of weekly conta  | ect hours, language –                          | - if other than Germa | n)  |  |
| V (4) + Ü   | Ĵ (2)  |  |                       |   |  |
|   | of assessment (type, scope, la<br>ormation on whether module c           |  |                       | tion offered — if not every seme-                                     |  |
| lf annou<br>examina<br>prox. 15<br>Languag  |  | inning of the course,<br>oprox. 20 minutes) or |                       | tion may be replaced by an oral<br>in groups of 2 candidates (ap-     |  |
| Allocatio   | on of places   |  |                       |   |  |
|   |  |  |                       |   |  |
| Additior  | nal information  |  |                       |   |  |
| Focuses<br>AT,SE,ES   | available for students of the N<br>S,LR,GE                               | laster's programme l                           | nformatik (Computer   | Science, 120 ECTS credits):   |  |
| Workloa   | d  |  |                       |   |  |
| 240 h   |  |  |                       |   |  |
| Teachin   | g cycle  |  |                       |   |  |
|   |  |  |                       |   |  |
| Referred  | <b>to in LPO I</b> (examination regu                                     | llations for teaching-o                        | degree programmes)    |   |  |
|   |  |  |                       |   |  |
| Module  | appears in   |  |                       |   |  |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016)<br>Master's degree (1 major) Computational Mathematics (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019) |  |  |                       |   |  |

### Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Aerospace Computer Science (2022) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Aerospace Computer Science (2023)

| Module         | e title   |  |                        |                     | Abbreviation  |
|----------------|---|--|------------------------|---------------------|---|
| Flight S       | Simulat   | or   |                        |                     | 10-I=FSIM-182-m01                                   |
| Module         | e coord   | inator   |                        | Module offered by   |   |
| holder         | of the (  | Chair of Computer Scienc   | e VIII                 | Institute of Comput | er Science  |
| ECTS           |   | od of grading  | Only after succ. com   | pl. of module(s)    |   |
| 10             |   | rical grade  |                        |                     |   |
| Duratio        |   | Module level   | Other prerequisites    |                     |   |
| 1 seme         | ster  | graduate   |                        |                     |   |
| Conten         | ts  |  |                        |                     |   |
|                |   | o cockpit, instruments in<br>ght execution, taxing, tak                                  |                        |                     | and dark start of an a320, flight<br>nd emergencies |
| Intende        | ed lear   | ning outcomes  |                        |                     |   |
|                |   | possess the technical, th<br>s is no licence to fly and i                                |                        |                     | ills to do a flight with an a320.                   |
| Course         | <b>s</b> (type                                    | , number of weekly conta   | ct hours, language —   | if other than Germa | n)  |
| R (6)          |   |  |                        |                     |   |
|                |   | s <b>essment</b> (type, scope, la<br>on on whether module ca                             |                        |                     | tion offered — if not every seme-                   |
| Separa         | te writt<br>ge of a                               | (10 to 15 pages) and pres<br>en examination for Maste<br>ssessment: German and,<br>bonus | er's students.         | 5 to 30 minutes)    |   |
| Allocat        | ion of p  | olaces   |                        |                     |   |
|                |   |  |                        |                     |   |
| Additio        | nal inf   | ormation   |                        |                     |   |
|                |   | able for students of the N<br>Subsection 3 Sentence 8                                    |                        |                     | Science, 120 ECTS credits): LR.                     |
| Worklo         | ad  |  |                        |                     |   |
| 300 h          |   |  |                        |                     |   |
| Teaching cycle |   |  |                        |                     |   |
|                |   |  |                        |                     |   |
| Referre        | d to in   | LPOI (examination regu   | lations for teaching-c | legree programmes)  |   |
|                |   |  | 0                      |                     |   |
| Module         | e appea   | ars in   |                        |                     |   |
|                |   | ee (1 major) Computer Sc   | ience (2018)           |                     |   |
|                | Master's degree (1 major) Computer Science (2021) |  |                        |                     |   |

| Module title  |                             |                        | Abbreviation                      |  |  |
|---|-----------------------------|------------------------|-----------------------------------|--|--|
| Aircraft Construction 10-I=FZB-182-m01  |                             |                        |                                   |  |  |
| Module coordinator  |                             | Module offered by      |                                   |  |  |
| holder of the Chair of Computer Scie  | nce VIII                    | Institute of Comput    | er Science                        |  |  |
| ECTS Method of grading  | Only after succ. con        | npl. of module(s)      |                                   |  |  |
| 10 numerical grade  |                             |                        |                                   |  |  |
| Duration Module level   | Other prerequisites         |                        |                                   |  |  |
| 1 semester graduate   |                             |                        |                                   |  |  |
| Contents  |                             |                        |                                   |  |  |
| <ul> <li>Assembly of a RV12 small airpl</li> <li>elements of the RV12 (aluminu</li> <li>Setting up a project team</li> <li>Tasks and allocation of respon</li> <li>Quality assurance</li> <li>Documentation of the work</li> <li>Building some elements of the</li> <li>Marketing and PR activities</li> </ul> Intended learning outcomes | m processing)<br>sibilities |                        |                                   |  |  |
|   | Un munic (                  |                        |                                   |  |  |
| Students have the necessary soft ski<br>complex and safety-critical projects.<br>aircraft construction. Students practi<br>stems and aluminum processing.   | Students have technic       | al, theoretical and pr | actical knowledge concerning      |  |  |
| Courses (type, number of weekly cor   | tact hours, language –      | - if other than Germa  | n)                                |  |  |
| R (6)   |                             |                        |                                   |  |  |
| Method of assessment (type, scope, ster, information on whether module  |                             |                        | tion offered — if not every seme- |  |  |
| project report (10 to 15 pages) and p<br>Language of assessment: German ar<br>creditable for bonus  |                             | 15 to 30 minutes)      |                                   |  |  |
| Allocation of places  |                             |                        |                                   |  |  |
|   |                             |                        |                                   |  |  |
| Additional information  |                             |                        |                                   |  |  |
| Focuses available for students of the<br>Cf. Section 3 Subsection 3 Sentence  |                             |                        | Science, 120 ECTS credits): LR.   |  |  |
| Workload  |                             |                        |                                   |  |  |
| 300 h   |                             |                        |                                   |  |  |
| Teaching cycle  |                             |                        |                                   |  |  |
|   |                             |                        |                                   |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |                             |                        |                                   |  |  |
|   |                             |                        |                                   |  |  |
| Module appears in   |                             |                        |                                   |  |  |
| Master's degree (1 major) Computer  | Science (2018)              |                        |                                   |  |  |
| Master's degree (1 major) Computer  |                             |                        |                                   |  |  |
| Master's degree (1 major) Computer  |                             |                        |                                   |  |  |
| Master's degree (1 major) Computer  | Science (2025)              |                        |                                   |  |  |

| Module title  |  |                           | Abbreviation                                      |   |                        |               |
|---|--|---------------------------|---|---|------------------------|---------------|
| Game Research Lab - Applications  |  |                           | 10-I=GRAP-182-mo                                  | 1   |                        |               |
| Module coordinator Module offered by  |  |                           | <u> </u>  |   |                        |               |
| holder  | of the (   | Chair of Computer Scie    | nce IX  | Institute of Comput   | er Science             |               |
| ECTS  | 1  | od of grading             | Only after succ. con                              | · · · · · ·   |                        |               |
| 10  | nume   | rical grade               |   |   |                        |               |
| Duratio   | on   | Module level              | Other prerequisites                               | i   |                        |               |
| 1 seme  | ester  | graduate                  |   |   |                        |               |
| Conten  | nts  |                           |   |   |                        |               |
| mes Er<br>ciples,<br>ter gan<br>ture. Al<br>works a<br>literatu<br>cations<br>enterta<br>stance<br>space<br>des de<br><b>Intend</b><br>We rec<br>phics,<br>Labs et<br>to deep | The Game Research Labs are project-oriented, master-level courses. In accordance with the definition of Ga-<br>mes Engineering, they concern themselves with the effective provision and the systematic application of prin-<br>ciples, methods and tools for the development and application of comprehensive software systems for compu-<br>ter games. There are four different directions of Game Research Labs: Theory, Applications, Design and Architec-<br>ture. All of them implement a scientific process during which the students develop a project based on preceding<br>works and a novel idea or hypothesis worthwhile exploring. Typical steps in a Game Research Lab include a short<br>literature survey, the development of a concept, its realisation and evaluation. The "Game Research Lab - Appli-<br>cations" aims at furthering or developing applications. While there are numerous viable application categories,<br>entertainment and serious games are often considered first. Alternative categories of applications could, for in-<br>stance, be remote control systems or social virtual worlds. These application categories, in turn, open up a vast<br>space of application domains: Consider science, education and engineering. This Game Research Lab also inclu-<br>des developing for specific target platforms such as specialised video consoles.<br><b>Intended learning outcomes</b><br>We recommend previous completion of basic courses in Games Engineering such as Interactive Computer Gra-<br>phics, Human-Computer Interaction or Game Development (corresponds with GameLab I). The Game Research<br>Labs empower the students to retrace current scientific works in great detail, to improve their research skills and<br>to deepen their expertise with respect to specific challenges in Games Engineering. In terms of contents, the "Ga-<br>me Research Lab - Applications" comprises knowledge and skills in the development life cycle of games, in the |                           |   |   |                        |               |
|   |  | · ·                       | ntact hours, language –                           | - if other than Germa   | ın)                    |               |
| R (4)   |  | · · · ·                   |   |   |                        |               |
|   |  |                           | language — if other th<br>can be chosen to earn   |   | ition offered — if not | every seme-   |
| Langua  |  | ssessment: German ar      | resentation of project (<br>nd/or English         | 15 to 30 minutes)   |                        |               |
| Allocat   | tion of p  | olaces                    |   |   |                        |               |
|   |  |                           |   |   |                        |               |
| Additio   | onal inf   | ormation                  |   |   |                        |               |
|   |  |                           | e Master's programme l<br>8 FSB (subject-specific | • •   | r Science, 120 ECTS    | credits): GE. |
| Worklo  | Workload   |                           |   |   |                        |               |
| 300 h   |  |                           |   |   |                        |               |
| Teaching cycle  |  |                           |   |   |                        |               |
|   |  |                           |   |   |                        |               |
| Referre   | ed to in   | LPOI (examination re      | gulations for teaching-                           | degree programmes)  |                        |               |
|   |  |                           |   |   |                        |               |
| Module  | e appea  | urs in                    |   |   |                        |               |
| Master's w  | ith 1 majo   | r Computer Science (2018) |   | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                        | page 64 / 140 |

Master's degree (1 major) Computer Science (2018) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2025)

| Module title  |   |                       | Abbreviation                      |  |
|---|---|-----------------------|-----------------------------------|--|
| Game Research Lab - Architectures   |   |                       | 10-I=GRAR-182-m01                 |  |
| Module coordinator  |   | Module offered by     |                                   |  |
| holder of the Chair of Computer Scien   | ce IX   | Institute of Comput   | er Science                        |  |
| ECTS Method of grading  | Only after succ. con  | npl. of module(s)     |                                   |  |
| 10 numerical grade  |   |                       |                                   |  |
| Duration Module level   | Other prerequisites   | i                     |                                   |  |
| 1 semester graduate   |   |                       |                                   |  |
| Contents  |   |                       |                                   |  |
| Contents         The Game Research Labs are project-oriented, master-level courses. In accordance with the definition of Games Engineering, they concern themselves with the effective provision and the systematic application of principles, methods and tools for the development and application of comprehensive software systems for computer games. There are four different directions of Game Research Labs: Theory, Applications, Design and Architecture. All of them implement a scientific process during which the students develop a project based on preceding works and a novel idea or hypothesis worthwhile exploring. Typical steps in a Game Research Lab include a short literature survey, the development of a concept, its realisation and evaluation. The "Game Research Lab - Architectures" is about Software Engineering perspectives in Games Engineering. Among those are the integration of different representations, models and calculi, their efficient and - at the same time - modular extensibility, maintenance and multi-facetted application. Accordingly, the subject of study of the course project can be existing design patterns in game engines, or the functional extension or overhaul of existing (sub-)engines. Next to the reflection and discussion of concrete architectures, efficiency can also be shown by means of performance analyses by profiling softwares. The resulting programming interfaces are another important field which is considered in the context of the "Game Research Lab - Architectures" course.         Intended learning outcomes         We recommend previous completion of basic courses in Games Engineering such as Game Labs II and III, complementing courses (e.g. Software Quality, Networked and Concurrent Programming) or advanced courses (e.g. Principles of Realtime Interactive Systems). The Game Research Labs empower the students to retrace current scientific works in great detail, to improve their res |   |                       |                                   |  |
| <b>Courses</b> (type, number of weekly cont   | act hours, language –   | - if other than Germa | n)                                |  |
| R (4)   |   |                       |                                   |  |
| <b>Method of assessment</b> (type, scope, l ster, information on whether module of  |   |                       | tion offered — if not every seme- |  |
|   | project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>creditable for bonus |                       |                                   |  |
| Allocation of places  |   |                       |                                   |  |
|   |   |                       |                                   |  |
| Additional information  |   |                       |                                   |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): GE. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).  |   |                       |                                   |  |
| Workload  |   |                       |                                   |  |
| 300 h   |   |                       |                                   |  |
| Teaching cycle  |   |                       |                                   |  |
|   |   |                       |                                   |  |

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

## Module appears in

Master's degree (1 major) Computer Science (2018) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2025)

| Module title   |   |   | Abbreviation         |                       |                                   |
|--|---|---|----------------------|-----------------------|-----------------------------------|
| Game   | Game Research Lab - Design 10-I=GRDE-182-mo1  |   |                      |                       |                                   |
| Module coordinator   |   | Module offered by                                     |                      |                       |                                   |
| holder   | ofthe   | Chair of Computer Scienc                              | e IX                 | Institute of Comput   | er Science                        |
| ECTS   | 1   | od of grading   | Only after succ. con | npl. of module(s)     |                                   |
| 10   |   | rical grade   |                      |                       |                                   |
| Durati   |   | Module level  | Other prerequisites  |                       |                                   |
| 1 seme   |   | graduate  |                      |                       |                                   |
| Conte  | its   |   |                      |                       |                                   |
| Contents         The Game Research Labs are project-oriented, master-level courses. In accordance with the definition of Games Engineering, they concern themselves with the effective provision and the systematic application of principles, methods and tools for the development and application of comprehensive software systems for computer games. There are four different directions of Game Research Labs: Theory, Applications, Design and Architecture. All of them implement a scientific process during which the students develop a project based on preceding works and a novel idea or hypothesis worthwhile exploring. Typical steps in a Game Research Lab include a short literature survey, the development of a concept, its realisation and evaluation. The design of virtual worlds and games is the focus of the "Game Research Lab - Design". It especially considers the design, import and presentation of complex and novel representations of computer graphics, haptics and audio, their (partially) automatic generation, the conceptualisation and implementation of virtual environments and levels, their presentation to the user/player as well as the design of user interfaces and innovative game mechanics.         Intended learning outcomes         We recommend previous completion of basic courses in Games Engineering such as Interactive Computer Graphics, Human-Computer Interaction, Asset Development or Game Development (corresponds with GameLab I). The Game Research Labs empower the students to retrace current scientific works in great detail, to improve their research skills and to deepen their expertise with respect to specific challenges in Games Engineering. In terms of contents, the "Game Research Lab - Applications" comprises knowledge and skills in the development life cycle of games, in the interdisciplinary discourse needed for applications in certain domains and in consideration of platform-specific |   |   |                      |                       |                                   |
|  | <b>es</b> (type   | , number of weekly conta                              | ct hours, language – | - if other than Germa | n)                                |
| R (4)  |   |   |                      | <b>^</b>              |                                   |
|  |   | sessment (type, scope, la<br>ion on whether module ca |                      |                       | tion offered — if not every seme- |
| Langu  | project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>creditable for bonus |   |                      |                       |                                   |
| Alloca   | tion of <sub>l</sub>  | olaces  |                      |                       |                                   |
|  |   |   |                      |                       |                                   |
| Additi   | onal inf  | ormation  |                      |                       |                                   |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): GE. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).   |   |   |                      |                       |                                   |
| Workl  | bad   |   |                      |                       |                                   |
| 300 h  |   |   |                      |                       |                                   |
| Teach  | ng cycl   | e   |                      |                       |                                   |
|  |   |   |                      |                       |                                   |
|  |   |   |                      |                       |                                   |

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

## Module appears in

Master's degree (1 major) Computer Science (2018) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computer Science (2025)

| Module title   |  |  | Abbreviation          |                       |                                   |  |
|--|--|--|-----------------------|-----------------------|-----------------------------------|--|
|  | Game Research Lab - Theory 10-I=GRLT-182-m01 |  |                       |                       |                                   |  |
| Module coordinator   |  |  |                       | Module offered by     |                                   |  |
| holder   | of the C                                     | hair of Computer Science                                     | e IX                  | Institute of Comput   | er Science                        |  |
| ECTS   |  | od of grading  | Only after succ. con  | npl. of module(s)     |                                   |  |
| 10   | nume   | rical grade  |                       |                       |                                   |  |
| Duratio  | on   | Module level   | Other prerequisites   |                       |                                   |  |
| 1 seme   | ester  | graduate   |                       |                       |                                   |  |
| Conter   | its  |  |                       |                       |                                   |  |
| The Game Research Labs are project-oriented, master-level courses. In accordance with the definition of Ga-<br>mes Engineering, they concern themselves with the effective provision and the systematic application of prin-<br>ciples, methods and tools for the development and application of comprehensive software systems for compu-<br>ter games. There are four different directions of Game Research Labs: Theory, Applications, Design and Architec-<br>ture. All of them implement a scientific process during which the students develop a project based on preceding<br>works and a novel idea or hypothesis worthwhile exploring. Typical steps in a Game Research Lab include a short<br>literature survey, the development of a concept, its realisation and evaluation. Theoretical foundations of Ga-<br>mes Engineering as well as their transfer and application are the focus of the "Game Research Lab - Theory". This<br>comprises the application, extension and innovation of formal representations, mathematics, algorithmics, for<br>instance in the areas of computer graphics, realtime physics computation or artificial intelligence. The applica-<br>tion, adaptation and innovation of optimisation approaches, formal process descriptions and verification in the<br>context of interactive simulations also lie in the scope of this Game Research Lab.<br><b>Intended learning outcomes</b><br>We recommend previous completion of basic courses in Games Engineering such as Interactive Computer Gra-<br>phics, Asset Development and Interactive Artificial Intelligence. The Game Research Labs empower the students<br>to retrace current scientific works in great detail, to improve their research skills and to deepen their expertise<br>with respect to specific challenges in Games Engineering. Formal systems and their applications to challenges<br>in Games Engineering are the focus of the "Game Research Lab - Theory". Accordingly, the students will deeply<br>immerse themselves into relevant topics in order to learn about, understand and learn to apply existing theore-<br>tical approaches. Their application to the res |  |  |                       |                       |                                   |  |
|  |  | ory and Games Engineerin<br>number of weekly conta           | -                     | - if other than Germa | n)                                |  |
| R (4)  |  |  |                       |                       |                                   |  |
|  |  | essment (type, scope, la<br>on on whether module ca          |                       |                       | tion offered — if not every seme- |  |
| Langua   |  | (10 to 15 pages) and pres<br>ssessment: German and/<br>bonus |                       | 15 to 30 minutes)     |                                   |  |
| Allocat  | tion of p                                    | olaces   |                       |                       |                                   |  |
|  |  |  |                       |                       |                                   |  |
| Additio  | onal info                                    | ormation   |                       |                       |                                   |  |
|  |  | able for students of the M<br>Subsection 3 Sentence 8 I      |                       | · · ·                 | Science, 120 ECTS credits): GE.   |  |
| Worklo   |  |  |                       |                       |                                   |  |
| 300 h  |  |  |                       |                       |                                   |  |
| -  | ng cycle                                     | 9  |                       |                       |                                   |  |
|  | 0 - ) - (                                    |  |                       |                       |                                   |  |
| Referre  | ed to in                                     | LPO I (examination regu                                      | lations for teaching- | degree programmes)    |                                   |  |
|  |  |  |                       |                       |                                   |  |
|  |  |  |                       |                       |                                   |  |

# Module appears in

| Master's degree (1 major) Computer Science (2018) |
|---|
| Master's degree (1 major) Computer Science (2021) |
| Master's degree (1 major) Computer Science (2023) |
| Master's degree (1 major) Computer Science (2025) |

-

| Module title   |   |  | Abbreviation                                  |   |                      |               |
|--|---|--|---|---|----------------------|---------------|
| Introdu  | Introduction into Human-Computer Interaction 10-I=HCI-161-mo1 |  |   |   |                      |               |
| Module   | coord   | inator   |   | Module offered by   |                      |               |
| holder o   | of the C  | Chair of Computer Scie                                     | nce IX  | Institute of Comput   | er Science           |               |
|  |   | od of grading  | Only after succ. con                          | 1 1   |                      |               |
| 5  |   | rical grade  |   |   |                      |               |
| Duratio  | - r   | Module level   | Other prerequisites                           |   |                      |               |
| 1 semes  |   | graduate   |   |   |                      |               |
|  | I   | Sidudic  |   |   |                      |               |
| ContentsHuman-Computer Interaction is concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. This course gives an introduction into the principle biological, physiological, and psychological constraints as defined by the human user and relates these constraints to the conceptual and technical solutions of today's computer systems and existing as well as prospective interaction metaphors between humans and computers.The course covers topics about human perception and cognition, memory and attention, the design of interactive systems, prominent evaluation methods, the principles of computer systems, typical input processing techniques, interface technology, and examples of typical interaction metaphors, from text-based input to graphical desktops to multimodal interfaces. Accompanying lab-work will introduce students to typical tasks involved in this field, i.e., prominent evaluation methods and prototyping of interfaces.Intended learning outcomesAfter the course, the students will have a broad understanding of the underlying principles of human users and computer systems. They will understand the constraints and capabilities of current user interfaces and they will learn about the necessary steps applied in user-centered design and development approaches.Courses (type, number of weekly contact hours, language — if other than German) |   |  |   |   |                      |               |
| V (3) + Ü  |   | accmant (tuna ccana  | languaga if other th                          | an Corman, ovamina  | tion offered if not  | aven, como    |
|  |   |  | language — if other the can be chosen to earn |   | tion onered — II not | every seme-   |
|  | ge of a   | of project results (appro<br>ssessment: German ar<br>bonus |   |   |                      |               |
| Allocati   | on of p   | olaces   |   |   |                      |               |
|  |   |  |   |   |                      |               |
| Additio  | nal info  | ormation   |   |   |                      |               |
|  |   |  | Master's programme l                          | nformatik (Computa  | Science 120 ECTS     | crodite), HCI |
|  |   |  | Master s programme r                          | monnatik (Computer  | Science, 120 ECTS    | Jeuits): HCI. |
| Workloa  | ad  |  |   |   |                      |               |
| 150 h  |   |  |   |   |                      |               |
| Teachin  | ig cycle  | 9  |   |   |                      |               |
|  |   |  |   |   |                      |               |
| Referre  | d to in   | LPOI (examination reg                                      | gulations for teaching-o                      | degree programmes)  |                      |               |
|  |   |  |   |   |                      |               |
| Module appears in  |   |  |   |   |                      |               |
| Master's degree (1 major) Computer Science (2016)  |   |  |   |   |                      |               |
| Master's degree (1 major) Digital Humanities (2016)  |   |  |   |   |                      |               |
| Master's degree (1 major) Computer Science (2017)  |   |  |   |   |                      |               |
| Master's degree (1 major) Computer Science (2018)  |   |  |   |   |                      |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   |   |  |   |   |                      |               |
| Suppler  | mentar  | y course MINT Teacher                                      | Education PLUS, Elite                         | Network Bavaria (EN   | B) (2020)            |               |
| Master'  | s teach   | ning degree Gymnasiur                                      | n MINT Teacher Educat                         | ion PLUS, Elite Netwo   | ork Bavaria (ENB) (2 | 025)          |
| Master's wit   | th 1 major  | Computer Science (2018)                                    |   | ırg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                      | page 72 / 140 |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's with 1 major Computer Science (2018)

|  |  |   |  | Abbreviation  |                      |                |
|--|--|---|--|---|----------------------|----------------|
| Interac  | tive Co  | mputer Graphics   |  |   | 10-l=ICG-161-m01     |                |
| Modul  | e coord  | inator  |  | Module offered by   |                      |                |
| holder   | of the C   | Chair of Computer Scier   | ice IX   | Institute of Comput   | er Science           |                |
| ECTS   | · · · · · · · · · · · · · · · · · · ·  | od of grading   | Only after succ. compl. of module(s)                                 |   |                      |                |
| 5  | · · · · ·  | rical grade   |  |   |                      |                |
| Duratio  |  | Module level  | Other prerequisites  | i   |                      |                |
| 1 seme   | I  | graduate  |  |   |                      |                |
| Compu<br>cificall<br>conten<br>about l<br>jection<br>line wi<br>Accom<br>or Dire<br><b>Intend</b><br>At the<br>compu<br>active :<br><b>Course</b><br>V (2) +<br><b>Metho</b><br>ster, in | Contents         Computer graphics studies methods for digitally synthesising and manipulating visual content. This course specifically concentrates on interactive graphics with an additional focus on 3D graphics as a requirement for many contemporary as well as for novel human-computer interfaces and computer games. The course will cover topics about light and images, lighting models, data representations, mathematical formulations of movements, projection as well as texturing methods. Theoretical aspects of the steps involved in ray-tracing and the raster pipeline will be complemented by algorithmical approaches for interactive image syntheses using computer systems. Accompanying software solutions will utilise modern graphics packages and languages like OpenGL, GLSL and/or DirectX.         Intended learning outcomes         At the end of the course, the students will have a broad understanding of the underlying theoretical models of computer graphics. They will be able to implement a prominent variety of these models, to build their own interactive graphics applications and to choose the right software tool for this task.         Courses (type, number of weekly contact hours, language — if other than German)         V (2) + Ü (2)         Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus) |   |  |   |                      |                |
| lf anno<br>examir<br>prox. 1<br>Separa<br>Langua   | unced l<br>nation o<br>5 minut<br>ite writt  | nation (approx. 60 to 12<br>by the lecturer at the be<br>f one candidate each (a<br>es per candidate).<br>en examination for Mas<br>ssessment: German an<br>bonus | ginning of the course,<br>approx. 20 minutes) or<br>ster's students. |   |                      |                |
| Allocat  | ion of p   | olaces  |  |   |                      |                |
|  |  |   |  |   |                      |                |
| Additio  | onal info  | ormation  |  |   |                      |                |
| Focuse   | s availa   | able for students of the  | Master's programme l   | nformatik (Computer   | Science, 120 ECTS of | credits): HCI. |
| Worklo   | ad   |   |  |   |                      |                |
| 150 h  |  |   |  |   |                      |                |
| Teachi   | ng cycl  | e   |  |   |                      |                |
|  |  |   |  |   |                      |                |
| Referre  | ed to in   | LPOI (examination reg   | ulations for teaching-   | degree programmes)  |                      |                |
|  |  | •   |  |   |                      |                |
|  | e appea  |   |  |   |                      |                |
|  | -  | ee (1 major) Computer S<br>ee (1 major) Computer S  |  |   |                      |                |
|  | -  | ee (1 major) Computer S   |  |   |                      |                |
|  | -  | ee (1 major) eXtended A   |  | tAI) (2020)   |                      |                |
| Master   | 's degre   | ee (1 major) Computer S   | Science (2021)   |   |                      |                |
| Master's w   | ith 1 major  | Computer Science (2018)   |  | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                      | page 74 / 140  |

Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Mathematics (2023)

| Modul  |   |   |   |   | Abbreviation  |
|--|---|---|---|---|---|
| Inform   | ation R   | etrieval  |   |   | 10-I=IR-161-m01   |
| Modul  | e coord   | inator  |   | Module offered by                               |   |
| Dean c   | of Studie   | es Informatik (Computer S   | Science)  | Institute of Comput                             | er Science  |
| ECTS   |   | od of grading   | Only after succ. con  | pl. of module(s)                                |   |
| 5  | nume  | rical grade   |   |   |   |
| Duratio  | on  | Module level  | Other prerequisites   |   |   |
| 1 seme   | ester   | graduate  |   |   |   |
| Conter   | nts   |   |   |   |   |
| data st<br>ges an  | ructure<br>d parad  | s (e.g. inverted index), q<br>igms, structured queries  | uery elements (e. g. (<br>), search engine (e. g  | query operations, rel<br>. architecture, crawli | t (tokenising, text properties),<br>evance feedback, query langua-<br>ing, interfaces, link analysis), me-<br>ation, information extraction). |
| Intend   | ed learı  | ning outcomes   |   |   |   |
|  |   | possess theoretical and p<br>know-how to create a sea   |   | n the area of informa                           | ation retrieval and have acquired   |
| Course   | es (type  | , number of weekly conta  | ct hours, language –  | - if other than Germa                           | n)  |
| V (2) +  | Ü (2)   |   |   |   |   |
| Metho  | d of ass  | sessment (type, scope, la   | nguage — if other tha   | an German, examina                              | tion offered — if not every seme-   |
|  |   | on on whether module ca   |   |   |   |
| lf anno<br>examir<br>prox. 1<br>Langua                   | ounced l<br>nation o<br>5 minut   | f one candidate each (ap<br>es per candidate).<br>ssessment: German and,  | inning of the course,<br>oprox. 20 minutes) or  |   | tion may be replaced by an oral<br>in groups of 2 candidates (ap-   |
| Allocat  | tion of p   | olaces  |   |   |   |
|  |   |   |   |   |   |
| Additio  | onal inf  | ormation  |   |   |   |
| Focuse<br>IT,IS,H  |   | able for students of the N  | laster's programme l  | nformatik (Computer                             | Science, 120 ECTS credits):   |
| Worklo   | bad   |   |   |   |   |
| 150 h  |   |   |   |   |   |
| Teachi   | ng cycl   | e   |   |   |   |
|  |   |   |   |   |   |
| Referre  | ed to in  | LPOI (examination regu  | lations for teaching-o  | legree programmes)                              |   |
|  |   |   |   |   |   |
|  | e appea   |   |   |   |   |
| Master<br>Master<br>Master<br>Supple<br>Master<br>Master | f's degro<br>f's degro<br>f's degro<br>f's teach<br>ementar<br>f's degro<br>f's degro | ee (1 major) Computer Sc<br>ee (1 major) Mathematics<br>ee (1 major) Computation<br>ee (1 major) Digital Huma<br>ning degree Gymnasium <i>I</i><br>y course MINT Teacher Ec<br>ee (1 major) Computer Sc<br>ee (1 major) Computer Sc<br>ee (1 major) Computation | s (2016)<br>Ial Mathematics (201<br>nities (2016)<br>WINT Teacher Educati<br>ducation PLUS, Elite I<br>ience (2017)<br>ience (2018) | ion PLUS, Elite Netwo<br>Network Bavaria (EN    |   |

## Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Master's degree (1 major) Mathematics (2019) Master's degree (1 major) Information Systems (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Modul  |  |   |  |                       | Abbreviation   |
|--|--|---|--|-----------------------|--|
| Crypto   | graphy                                     | and Data Security   |  |                       | 10-l=KD-161-m01  |
| Modul  | e coord                                    | inator  |  | Module offered by     |  |
| Dean c   | of Studi                                   | es Informatik (Computer S   | Science)   | Institute of Comput   | er Science   |
| ECTS   | Meth                                       | od of grading   | Only after succ. com   | pl. of module(s)      |  |
| 5  | nume                                       | rical grade   |  |                       |  |
| Durati   | on   | Module level  | Other prerequisites  |                       |  |
| 1 seme   | ester                                      | graduate  |  |                       |  |
| Conter   | nts  |   |  |                       |  |
| RSA, D   | iffie-He                                   |   | ser-Micali, digital sig  | nature, challenge-re  | oublic key cryptography systems,<br>sponse methods, secret sharing,                                    |
| Intend   | ed lear                                    | ning outcomes   |  |                       |  |
| stems,<br>wasse                                  | Vernar<br>r-Micali                         | n one-time pad, AES, per  | fect security, public k<br>nge-response metho                    | key cryptography, RS  | private key cryptography sy-<br>A, Diffie-Hellman, Elgamal, Gold-<br>llionaire problem, secure circuit |
| Course   | es (type                                   | , number of weekly conta  | ct hours, language –   | - if other than Germa | n)   |
| V (2) +  | Ü (2)                                      |   |  |                       |  |
|  |  | sessment (type, scope, la<br>ion on whether module ca   |  |                       | tion offered — if not every seme-  |
| lf anno<br>examir<br>prox. 1<br>Separa<br>Langua | ounced<br>nation o<br>5 minut<br>nte writt | of one candidate each (ap<br>tes per candidate).<br>ten examination for Maste<br>ssessment: German and/ | inning of the course,<br>pprox. 20 minutes) or<br>er's students. |                       | tion may be replaced by an oral<br>in groups of 2 candidates (ap-                                      |
| Alloca   | tion of <sub>l</sub>                       | places  |  |                       |  |
|  |  |   |  |                       |  |
| Additio  | onal inf                                   | ormation  |  |                       |  |
| Focuse<br>SE, IT,                                |  | able for students of the M  | laster's programme li  | nformatik (Computer   | Science, 120 ECTS credits): AT,  |
| Worklo   | oad  |   |  |                       |  |
| 150 h  |  |   |  |                       |  |
| Teachi   | ng cycl                                    | e   |  |                       |  |
|  |  |   |  |                       |  |
| Referre  | ed to in                                   | LPO I (examination regu   | lations for teaching-o   | degree programmes)    |  |
|  |  |   |  |                       |  |
| Modul  | e appea                                    | ars in  |  |                       |  |
|  |  | ee (1 major) Computer Sc  | ience (2016)   |                       |  |
| Master   | 's degr                                    | ee (1 major) Computer Sc  | ience (2017)   |                       |  |
| Master   | 's degr                                    | ee (1 major) Computer Sc  | ience (2018)   |                       |  |
|  |  |   |  |                       |  |

| Module title Abbreviation  |               |
|--|---------------|
| Artificial Intelligence 1 10-I=KI1-161-m01   |               |
| Module coordinator Module offered by   |               |
|  |               |
| holder of the Chair of Computer Science VI     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 graduate  |               |
| Contents   |               |
| Intelligent agents, uninformed and heuristic search, constraint problem solving, search with partial propositional and predicate logic and inference, knowledge representation.        | information,  |
| Intended learning outcomes   |               |
| The students possess theoretical and practical knowledge about artificial intelligence in the area of search and logic and are able to assess possible applications.                   | agents,       |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)   |               |
| V (2) + Ü (2)  |               |
| Method of assessment (type, scope, language — if other than German, examination offered — if not   | every seme-   |
| ster, information on whether module can be chosen to earn a bonus)   |               |
| written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replace                                |               |
| examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 cand  | idates (ap-   |
| prox. 15 minutes per candidate).<br>Language of assessment: German and/or English  |               |
| creditable for bonus   |               |
| Allocation of places   |               |
|  |               |
| Additional information   |               |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS AT,SE,IS,HCI   | credits):     |
| Workload   |               |
| 150 h  |               |
| Teaching cycle   |               |
|  |               |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |               |
|  |               |
| Module appears in  |               |
| Master's degree (1 major) Computer Science (2016)  |               |
| Master's degree (1 major) Mathematics (2016)   |               |
| Master's degree (1 major) Physics (2016)   |               |
| Master's degree (1 major) Nanostructure Technology (2016)  |               |
| Master's degree (1 major) Computational Mathematics (2016)   |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) | 016)          |
| Master's degree (1 major) Computer Science (2017)  |               |
| Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)   |               |
| Master's degree (1 major) Computer Science (2010)<br>Master's degree (1 major) Computational Mathematics (2019)  |               |
| Master's degree (1 major) Mathematics (2019)   |               |
| Master's with 1 major Computer Science (2018) JMU Würzburg • generated 19-Apr-2025 • exam.   | page 79 / 140 |

Master's degree (1 major) Information Systems (2019)

Master's degree (1 major) Nanostructure Technology (2020)

Master's degree (1 major) Physics (2020)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

Master's degree (1 major) Aerospace Computer Science (2020)

Master's degree (1 major) Physics International (2020)

Master's degree (1 major) Quantum Engineering (2020)

Master's degree (1 major) Quantum Technology (2021)

| Module                                     | e title                               |   |                                      |   | Abbreviation               |               |  |
|--|---------------------------------------|---|--------------------------------------|---|----------------------------|---------------|--|
| Artificial Intelligence 2 10-I=Kl2-161-m01 |                                       |   |                                      |   |                            |               |  |
| Module                                     | e coord                               | inator  |                                      | Module offered by   |                            |               |  |
|  |                                       | Chair of Computer Scier                               |                                      | Institute of Comput   | or Scionco                 |               |  |
| ECTS                                       |                                       | od of grading   | Only after succ. compl. of module(s) |   |                            |               |  |
|  | · · · · · · · · · · · · · · · · · · · | rical grade   |                                      |   |                            |               |  |
| 5  | · · · · ·                             |   |                                      |   |                            |               |  |
| Duration                                   |                                       | Module level graduate                                 | Other prerequisites                  |   |                            |               |  |
| Conten                                     |                                       | 3.44446   |                                      |   |                            |               |  |
|  |                                       | babilistic closure and B                              | avesian networks util                | ty theory and decida  | hility problems lear       | ning from     |  |
|  |                                       | knowledge while learn                                 |                                      |   |                            |               |  |
|  |                                       | ng of natural language.                               |                                      |   | <i>. . . . . . . . . .</i> |               |  |
| Intend                                     | ed learr                              | ning outcomes   |                                      |   |                            |               |  |
|  |                                       | oossess theoretical and<br>ng and language proce      |                                      |   |                            | probabilistic |  |
|  |                                       | , number of weekly con                                |                                      |   |                            |               |  |
| V (2) +                                    |                                       |   |                                      | n other than defind   |                            |               |  |
|  |                                       |   |                                      |   | tion offered if not        |               |  |
|  |                                       | essment (type, scope, on on whether module            |                                      |   | tion offered — If not      | every seme-   |  |
|  |                                       |   |                                      |   |                            |               |  |
|  |                                       | nation (approx. 60 to 12<br>by the lecturer at the be |                                      | the written examina   | tion may be replace        | d by an oral  |  |
|  |                                       | f one candidate each (a                               |                                      |   |                            |               |  |
|  |                                       | es per candidate).                                    | 11                                   |   | 5                          |               |  |
|  |                                       | ssessment: German an                                  | d/or English                         |   |                            |               |  |
| credita                                    | ble for                               | bonus   |                                      |   |                            |               |  |
| Allocat                                    | ion of p                              | olaces  |                                      |   |                            |               |  |
|  |                                       |   |                                      |   |                            |               |  |
| Additio                                    | onal info                             | ormation  |                                      |   |                            |               |  |
|  | s availa<br>S,HCI,G                   | able for students of the<br>iE                        | Master's programme I                 | nformatik (Computer   | Science, 120 ECTS of       | credits):     |  |
| Worklo                                     | ad                                    |   |                                      |   |                            |               |  |
| 150 h                                      |                                       |   |                                      |   |                            |               |  |
|  | ng cycl                               | 9   |                                      |   |                            |               |  |
| reaction                                   | ing cycli                             |   |                                      |   |                            |               |  |
|  |                                       |   |                                      |   |                            |               |  |
| Referre                                    | ed to in                              | LPOI (examination reg                                 | gulations for teaching-              | degree programmes)  |                            |               |  |
|  |                                       |   |                                      |   |                            |               |  |
|  | e appea                               |   |                                      |   |                            |               |  |
|  | -                                     | ee (1 major) Computer S                               |                                      |   |                            |               |  |
|  | -                                     | ee (1 major) Mathemati                                |                                      |   |                            |               |  |
|  | -                                     | ee (1 major) Computatio                               |                                      |   |                            |               |  |
|  |                                       | ning degree Gymnasiun                                 |                                      |   |                            | 016)          |  |
|  |                                       | y course MINT Teacher                                 |                                      | Network Bavaria (EN   | B) (2016)                  |               |  |
|  | -                                     | ee (1 major) Computer S                               |                                      |   |                            |               |  |
|  | -                                     | ee (1 major) Computer S                               |                                      | a)  |                            |               |  |
|  | -                                     | ee (1 major) Computatio                               |                                      | 9)  |                            |               |  |
|  | -                                     | ee (1 major) Mathemati<br>ee (1 major) Informatior    | -                                    |   |                            |               |  |
| master                                     | 5 uegli                               | c (I major) miormation                                | 1 Jystems (2019)                     |   |                            |               |  |
| Master's w                                 | ith 1 major                           | Computer Science (2018)                               |                                      | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                            | page 81 / 140 |  |

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020)

| Modul  | e title                                    |   |  |                       | Abbreviation   |
|--|--|---|--|-----------------------|--|
| Compu  | Itationa                                   | al Complexity   |  |                       | 10-l=KT-161-m01  |
| Modul  | e coord                                    | inator  |  | Module offered by     |  |
| Dean c   | of Studi                                   | es Informatik (Computer S   | Science)   | Institute of Comput   | er Science   |
| ECTS   | Meth                                       | od of grading   | Only after succ. com   | pl. of module(s)      |  |
| 5  | nume                                       | rical grade   |  |                       |  |
| Durati   | on   | Module level  | Other prerequisites  |                       |  |
| 1 seme   | ester                                      | graduate  |  |                       |  |
| Conter   | nts  |   |  |                       |  |
| sumpt  | ion vers                                   |   | terminism versus ind   | leterminism, hierarch | nd time classes, memory con-<br>hical theorems, translation me-<br>of systems.                 |
| Intend   | ed lear                                    | ning outcomes   |  |                       |  |
| classe<br>determ                                 | s, gene<br>ninism v                        | ral relationships between   | space and time claserarchical theorems,                          | ses, memory consur    | complexity measurements and<br>nption versus computation time,<br>, P-NP problem, completeness |
| Course   | es (type                                   | , number of weekly conta  | ct hours, language –   | - if other than Germa | n)   |
| V (2) +  | Ü (2)                                      |   |  |                       |  |
|  |  | sessment (type, scope, la<br>ion on whether module ca   |  |                       | tion offered — if not every seme-  |
| lf anno<br>examir<br>prox. 1<br>Separa<br>Langua | ounced<br>nation o<br>5 minut<br>nte writt | of one candidate each (ap<br>tes per candidate).<br>ten examination for Maste<br>ssessment: German and/ | inning of the course,<br>pprox. 20 minutes) or<br>er's students. |                       | tion may be replaced by an oral<br>in groups of 2 candidates (ap-                              |
| Alloca   | tion of <sub>l</sub>                       | places  |  |                       |  |
|  |  |   |  |                       |  |
| Additio  | onal inf                                   | ormation  |  |                       |  |
| Focuse<br>IT, IS, I                              |  | able for students of the M  | laster's programme l   | nformatik (Computer   | Science, 120 ECTS credits): AT,  |
| Worklo   | oad  |   |  |                       |  |
| 150 h  |  |   |  |                       |  |
| Teachi   | ng cycl                                    | e   |  |                       |  |
|  |  |   |  |                       |  |
| Referre  | ed to in                                   | LPO I (examination regu   | lations for teaching-  | degree programmes)    |  |
|  |  |   |  |                       |  |
| Modul  | e appea                                    | ars in  |  |                       |  |
|  |  | ee (1 major) Computer Sc  | ience (2016)   |                       |  |
| Master   | 's degr                                    | ee (1 major) Computer Sc  | ience (2017)   |                       |  |
| Master   | 's degr                                    | ee (1 major) Computer Sc  | ience (2018)   |                       |  |
|  |  |   |  |                       |  |

| Modul   | e title                                 |   |   |  | Abbreviation          |               |
|---|---|---|---|--|-----------------------|---------------|
| Compu   | Itationa                                | l Complexity II   |   |  | 10-l=KT2-161-m01      |               |
| Modul   | e coord                                 | inator  |   | Module offered by  |                       |               |
| Dean c  | of Studio                               | es Informatik (Compute  | er Science)   | Institute of Comput  | er Science            |               |
| ECTS  | Metho                                   | od of grading   | Only after succ. cor  | npl. of module(s)  |                       |               |
| 5   |   | rical grade   |   |  |                       |               |
| Durati  | on                                      | Module level  | Other prerequisites   | 5  |                       |               |
| 1 seme  | ester                                   | graduate  |   |  |                       |               |
| Conter  | nts                                     |   |   |  |                       |               |
|   |   | NP-complete sets, auto<br>stic algorithms.  | reducibility, interactive                                       | e proof systems, poly  | nomial time hierarcl  | ny, complexi- |
| Intend  | ed lear                                 | ning outcomes   |   |  |                       |               |
|   |   | oossess a fundamental<br>ty, interactive proof sys  |   |  |                       |               |
| Course  | es (type                                | , number of weekly con  | tact hours, language -  | – if other than Germa  | n)                    |               |
| V (2) +   |   | ,   |   |  | ,                     |               |
|   |   | essment (type, scope,<br>on on whether module   |   |  | tion offered — if not | every seme-   |
| written<br>If anno<br>examin<br>prox. 1<br>Langua | examin<br>ounced<br>nation c<br>5 minut | nation (approx. 60 to 12<br>by the lecturer at the be<br>of one candidate each (<br>res per candidate).<br>ssessment: German an | 20 minutes).<br>eginning of the course<br>approx. 20 minutes) o | , the written examina  |                       |               |
| Alloca  | tion of p                               | olaces  |   |  |                       |               |
|   |   |   |   |  |                       |               |
| Additio   | onal inf                                | ormation  |   |  |                       |               |
| Focuse<br>SE, IT,                                 |   | able for students of the  | Master's programme  | Informatik (Computer   | Science, 120 ECTS     | credits): AT, |
| Worklo  |   |   |   |  |                       |               |
| 150 h   |   |   |   |  |                       |               |
|   | ng cycl                                 | e   |   |  |                       |               |
|   |   |   |   |  |                       |               |
| Referre   | ed to in                                | LPOI (examination reg   | gulations for teaching-   | degree programmes)   |                       |               |
|   |   |   |   |  |                       |               |
| Modul   | e appea                                 | irs in  |   |  |                       |               |
| Master  | r's degr                                | ee (1 major) Computer S   | Science (2016)  |  |                       |               |
|   | -                                       | ee (1 major) Mathemati  |   |  |                       |               |
| Master  | r's degr                                | ee (1 major) Computatio   | onal Mathematics (201   | 16)  |                       |               |
| Master  | r's teacl                               | ning degree Gymnasiun   | n MINT Teacher Educat   | tion PLUS, Elite Netwo   | ork Bavaria (ENB) (2  | 016)          |
| Supple  | ementai                                 | y course MINT Teacher   | Education PLUS, Elite   | Network Bavaria (EN  | B) (2016)             |               |
|   | -                                       | ee (1 major) Computer S   | -   |  |                       |               |
|   |   | ee (1 major) Computer S   |   |  |                       |               |
|   |   | ee (1 major) Computatio   |   | 19)  |                       |               |
|   | -                                       | ee (1 major) Mathemati  | -   |  |                       | ,             |
|   |   | ning degree Gymnasiun<br>y course MINT Teacher  |   |  |                       | 020)          |
| Master's w  | vith 1 majo                             | Computer Science (2018)   |   | urg • generated 19-Apr-2025 •<br>ord Master (120 ECTS) Informa |                       | page 84 / 140 |

| Module   |   |   |   |                                 | Abbreviation  |
|--|---|---|---|---------------------------------|---|
| Logic Pr   | _   | _   |   |                                 | 10-I=LP-172-m01   |
| Module   | coord   | inator  |   | Module offered by               |   |
| holder o   | of the C  | hair of Computer Science  | e l   | Institute of Comput             | er Science  |
|  |   | od of grading   | Only after succ. con  | npl. of module(s)               |   |
| - 1  | r   | rical grade   |   |                                 |   |
| Duratio  |   | Module level  | Other prerequisites   |                                 |   |
| 1 semes  |   | graduate  |   |                                 |   |
| Content  | s   |   |   |                                 |   |
| program<br>gregatio  | nming<br>ons. Co  | language Prolog: recursio   | on, predicate-oriente<br>databases. Comparis  | d programming, bacl             | lution. Introduction to the logic<br>«tracking, cut, side effects, ag-<br>ort introduction of advanced con- |
| Intende  | d learr   | ning outcomes   |   |                                 |   |
|  | t and o   | declarative programs in P   |   |                                 | g. They are able to implement<br>ne traditional imperative pro-   |
| Courses  | s (type,  | number of weekly conta  | ct hours, language –  | - if other than Germa           | n)  |
| V (2) + Ü  | j (2)   |   |   |                                 |   |
| ster, info<br>written e<br>If annou<br>examina<br>prox. 15<br>Languag<br>creditab<br>Allocatie | ormati<br>examir<br>unced l<br>ation o<br>minut<br>ge of a<br>ble for<br><b>on of p</b> | on on whether module ca<br>nation (approx. 60 to 120<br>by the lecturer at the beg<br>f one candidate each (ap<br>es per candidate).<br>ssessment: German and/<br>bonus | an be chosen to earn<br>minutes).<br>inning of the course,<br>pprox. 20 minutes) or | a bonus)<br>the written examina | tion offered — if not every seme-<br>tion may be replaced by an oral<br>in groups of 2 candidates (ap-      |
| Focuses<br>SE, IT, IS  |   | able for students of the M  | laster's programme l  | nformatik (Computer             | Science, 120 ECTS credits): AT,   |
| Workloa  | ad  |   |   |                                 |   |
| 150 h  |   |   |   |                                 |   |
| Teachin  | g cycl  | 9   |   |                                 |   |
|  |   |   |   |                                 |   |
| Referred   | d to in   | LPOI (examination regu  | lations for teaching-o  | degree programmes)              |   |
|  |   |   |   |                                 |   |
| Module   | appea   | rs in   |   |                                 |   |
| Master's<br>Master's<br>Master's<br>Master's   | s degre<br>s degre<br>s degre<br>s teach  | ee (1 major) Computer Sc<br>ee (1 major) Computer Sc<br>ee (1 major) Information S<br>ning degree Gymnasium I<br>y course MINT Teacher Ec                               | ience (2018)<br>Systems (2019)<br>WINT Teacher Educat                               |                                 |   |

|  | e title   |  |  | Abbreviation                                  |              |
|--|---|--|--|---|--------------|
| Perforr  | mance Evaluation of Distribut   | ed Systems   |  | 10-I=LVS-161-m01                              |              |
| Modul  | e coordinator   |  | Module offered by                                  |   |              |
|  | of the Chair of Computer Scie   | ance III   | Institute of Comput                                | er Science                                    |              |
| ECTS   | Method of grading   | Only after succ. compl. of module(s)   |  |   |              |
| 8  | numerical grade   |  |  |   |              |
| Duratio  |   | Other prerequisites  |  |   |              |
| 1 seme   |   |  |  |   |              |
| Conten   |   |  |  |   |              |
| proces<br>non-Ma<br>compu  | theoretic models, fundament<br>ses, methods for performanc<br>arkov and time critical system<br>ter systems and networks: th  | e analysis of technical s<br>ns, matrix analytical me  | ystems, queue-/traft<br>hod, practical exam        | ic theory, analysis o<br>ples for performance | of Markov,   |
|  | ed learning outcomes  |  |  |   |              |
|  | udents possess the methodic<br>of the theory of probability a   |  |  | y to model technica                           | l systems by |
| Course   | es (type, number of weekly co   | ntact hours, language –  | - if other than Germa                              | n)  |              |
| V (4) +  | Ü (2)   |  |  |   |              |
| Metho  | d of assessment (type, scope  | , language — if other th   | an German, examina                                 | tion offered — if not                         | every seme-  |
| ster, in   | formation on whether modul  | e can be chosen to earn  | a bonus)   |   |              |
|  | ble for bonus<br>tion of places   |  |  |   |              |
| Additic  | onal information  |  |  |   |              |
| Focuse<br>AT,IT,G  | es available for students of th   | e Master's programme I   | nformatik (Computer                                | Science, 120 ECTS of                          | credits):    |
| Worklo   | bad   |  |  |   |              |
| 240 h  |   |  |  |   |              |
|  | ng cycle  |  |  |   |              |
|  |   |  |  |   |              |
|  |   |  |  |   |              |
|  | ed to in LPO I (examination re  | gulations for teaching.  | degree programmes)                                 |   |              |
|  | ed to in LPO I (examination re  | egulations for teaching-   | degree programmes)                                 |   |              |
| Referre  |   | egulations for teaching-   | degree programmes)                                 |   |              |
| Referre<br><br>Module  | e appears in  |  | degree programmes)                                 |   |              |
| Referre<br><br>Module<br>Master  | <b>e appears in</b><br>'s degree (1 major) Computer   | Science (2016)   | degree programmes)                                 |   |              |
| Referre<br><br>Module<br>Master<br>Master  | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema  | Science (2016)<br>tics (2016)  |  |   |              |
| Referre<br><br>Module<br>Master<br>Master<br>Master  | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat   | Science (2016)<br>tics (2016)<br>ional Mathematics (201  | 6)   | ntk Bayaria (ENR) (a.                         | 016)         |
| Referre<br><br>Module<br>Master<br>Master<br>Master<br>Master                                | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu   | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>m MINT Teacher Educat   | 6)<br>ion PLUS, Elite Netwo                        |   | 016)         |
| Referre<br><br>Module<br>Master<br>Master<br>Master<br>Supple                                | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu<br>ementary course MINT Teache  | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>m MINT Teacher Educat<br>r Education PLUS, Elite  | 6)<br>ion PLUS, Elite Netwo                        |   | 016)         |
| Referrer<br><br>Module<br>Master<br>Master<br>Master<br>Supple<br>Master                     | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu<br>ementary course MINT Teache<br>r's degree (1 major) Computer                           | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>m MINT Teacher Educat<br>r Education PLUS, Elite<br>Science (2017)  | 6)<br>ion PLUS, Elite Netwo                        |   | 016)         |
| Referrer<br><br>Module<br>Master<br>Master<br>Master<br>Supple<br>Master<br>Master           | e appears in<br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu<br>ementary course MINT Teache<br>r's degree (1 major) Computer<br>r's degree (1 major) Computer | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>m MINT Teacher Educat<br>r Education PLUS, Elite<br>Science (2017)<br>Science (2018)  | 6)<br>ion PLUS, Elite Netwo<br>Network Bavaria (EN |   | 016)         |
| <br>Modulo<br>Master<br>Master<br>Master<br>Supple<br>Master<br>Master<br>Master             | <b>e appears in</b><br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu<br>ementary course MINT Teache<br>r's degree (1 major) Computer                           | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>im MINT Teacher Educat<br>r Education PLUS, Elite<br>Science (2017)<br>Science (2018)<br>ional Mathematics (201               | 6)<br>ion PLUS, Elite Netwo<br>Network Bavaria (EN |   | 016)         |
| Referrer<br><br>Master<br>Master<br>Master<br>Supple<br>Master<br>Master<br>Master<br>Master | e appears in<br>r's degree (1 major) Computer<br>r's degree (1 major) Mathema<br>r's degree (1 major) Computat<br>r's teaching degree Gymnasiu<br>ementary course MINT Teache<br>r's degree (1 major) Computer<br>r's degree (1 major) Computat | Science (2016)<br>tics (2016)<br>ional Mathematics (201<br>m MINT Teacher Educat<br>r Education PLUS, Elite<br>Science (2017)<br>Science (2018)<br>ional Mathematics (201<br>tics (2019) | 6)<br>ion PLUS, Elite Netwo<br>Network Bavaria (EN | 3) (2016)                                     | 016)         |

## Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Aerospace Computer Science (2022) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022)

| Modul                       | e title   |                         |   | Abbreviation           |               |
|-----------------------------|---|-------------------------|---|------------------------|---------------|
| Medica                      | al Informatics  |                         |   | 10-l=Ml-161-m01        |               |
| Modul                       | e coordinator   |                         | Module offered by   | <u> </u>               |               |
| holder                      | of the Chair of Computer Scie   | nce VI                  | Institute of Comput   | er Science             |               |
| ECTS                        | Method of grading   | Only after succ. con    | · · · · · ·   |                        |               |
| 5                           | numerical grade   |                         |   |                        |               |
| Duratio                     |   | Other prerequisites     |   |                        |               |
| 1 seme                      | · · · · · · · · · · · · · · · · · · ·   |                         |   |                        |               |
| Conter                      | its   |                         |   |                        |               |
| mary a                      | nic patient folder, coding of m<br>nd functional units, medical d<br>earch, case-based training sys   | lecision making and as  | sistance systems, st  |                        |               |
| Intend                      | ed learning outcomes  |                         |   |                        |               |
|                             | Idents possess theoretical an   | d practical knowledge a | about the application   | n of computer scienc   | e methods in  |
| Course                      | es (type, number of weekly cor  | ntact hours, language – | - if other than Germa   | ın)                    |               |
| V (2) +                     | Ü (2)   |                         |   |                        |               |
|                             | <b>d of assessment</b> (type, scope, formation on whether module  |                         |   | ition offered — if not | every seme-   |
| examir<br>prox. 1<br>Langua | ounced by the lecturer at the b<br>nation of one candidate each (<br>5 minutes per candidate).<br>age of assessment: German ar<br>ble for bonus | (approx. 20 minutes) or |   |                        |               |
| Allocat                     | tion of places  |                         |   |                        |               |
|                             |   |                         |   |                        |               |
| Additio                     | onal information  |                         |   |                        |               |
|                             | es available for students of the<br>S,HCI,GE  | e Master's programme I  | nformatik (Compute  | r Science, 120 ECTS (  | credits):     |
| Worklo                      | ad  |                         |   |                        |               |
| 150 h                       |   |                         |   |                        |               |
|                             | ng cycle  |                         |   |                        |               |
|                             |   |                         |   |                        |               |
| Deferre                     | d to in IDO L (avamination to   | gulations for tooshing  | dagraa pragrammac)  |                        |               |
| Referre                     | ed to in LPO I (examination re  |                         | degree programmes)  |                        |               |
| Modul                       | e appears in  |                         |   |                        |               |
|                             | 's degree (1 major) Computer  | Science (2016)          |   |                        |               |
|                             | 's degree (1 major) Mathemat  |                         |   |                        |               |
|                             | f's degree (1 major) Computati  |                         | 6)  |                        |               |
|                             | 's teaching degree Gymnasiur  |                         |   | ork Bavaria (ENB) (2   | 016)          |
|                             | ementary course MINT Teacher  |                         |   |                        | ,             |
|                             | 's degree (1 major) Computer  |                         |   |                        |               |
|                             | 's degree (1 major) Computer  |                         |   |                        |               |
|                             | 's degree (1 major) Computati   |                         | 9)  |                        |               |
|                             | 's degree (1 major) Mathemat  |                         | -   |                        |               |
|                             | 's degree (1 major) Informatio  | -                       |   |                        |               |
| Master's w                  | ith 1 major Computer Science (2018)   |                         | urg • generated 19-Apr-2025 (<br>rd Master (120 ECTS) Informa |                        | page 88 / 140 |



Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Module                                 | e title                      |  |   |   | Abbreviation           |               |
|--|------------------------------|--|---|---|------------------------|---------------|
| Mathe                                  | matical                      | Logic  |   |   | 10-l=ML-161-m01        |               |
| Module                                 | e coord                      | inator   |   | Module offered by   | <u> </u>               |               |
| Dean o                                 | of Studio                    | es Informatik (Compute   | er Science)                                       | Institute of Comput   | er Science             |               |
| ECTS                                   | 1                            | od of grading  | Only after succ. con                              |   |                        |               |
| 5                                      |                              | rical grade  |   |   |                        |               |
| Duratio                                |                              | Module level   | Other prerequisites                               |   |                        |               |
| 1 seme                                 |                              | graduate   |   |   |                        |               |
| Conten                                 |                              | 3.44440  |   |   |                        |               |
|  |                              | logic, first-order predic<br>ncompleteness theore  |   |   |                        |               |
|  |                              | ning outcomes  |   |   |                        |               |
|  | -                            | oossess a fundamental  | and applicable knowl                              | edge in the areas of  | propositional logic,   | first-order   |
| predica                                | ate logi                     | c, proof and deduction<br>ecidability and nonaxio  | , Gödel's completenes                             | s theorem, Tarski the   |                        |               |
| Course                                 | <b>s</b> (type               | , number of weekly con   | tact hours, language –                            | - if other than Germa   | ın)                    |               |
| V (2) +                                |                              |  |   |   |                        |               |
| Metho                                  | d of ass                     | <b>sessment</b> (type, scope,<br>on on whether module  |   |   | ition offered — if not | every seme-   |
| lf anno<br>examir<br>prox. 1<br>Langua | unced<br>nation c<br>5 minut | nation (approx. 60 to 12<br>by the lecturer at the bo<br>of one candidate each (<br>ces per candidate).<br>ssessment: German an<br>bonus | eginning of the course,<br>approx. 20 minutes) or |   |                        |               |
|  | ion of p                     |  |   |   |                        |               |
|  |                              |  |   |   |                        |               |
| Additio                                | onal inf                     | ormation   |   |   |                        |               |
| Focuse<br>AT,SE,I                      |                              | able for students of the   | Master's programme I                              | nformatik (Computer   | r Science, 120 ECTS (  | credits):     |
| Worklo                                 | ad                           |  |   |   |                        |               |
| 150 h                                  |                              |  |   |   |                        |               |
| Teachi                                 | ng cycl                      | ۵  |   |   |                        |               |
| reaction                               | ing cycl                     | 6  |   |   |                        |               |
|  |                              |  |   |   |                        |               |
| Referre                                | ed to in                     | LPOI (examination reg  | gulations for teaching-                           | degree programmes)  |                        |               |
|  |                              |  |   |   |                        |               |
| Module                                 |                              |  |   |   |                        |               |
|  | -                            | ee (1 major) Computer S  |   |   |                        |               |
|  | -                            | ee (1 major) Mathemati   |   |   |                        |               |
|  |                              | ee (1 major) Computati   |   |   |                        |               |
| Master                                 | 's teacl                     | ning degree Gymnasiur  | n MINT Teacher Educat                             | ion PLUS, Elite Netw  | ork Bavaria (ENB) (2   | 016)          |
| Supple                                 | ementai                      | y course MINT Teacher  | Education PLUS, Elite                             | Network Bavaria (EN   | B) (2016)              |               |
| Master                                 | 's degr                      | ee (1 major) Computer (  | Science (2017)                                    |   |                        |               |
| Master                                 | 's degr                      | ee (1 major) Computer (  | Science (2018)                                    |   |                        |               |
| Master                                 | 's degr                      | ee (1 major) Computati   | onal Mathematics (201                             | 9)  |                        |               |
| Master                                 | 's degr                      | ee (1 major) Mathemati   | cs (2019)   |   |                        |               |
| Master                                 | 's teacl                     | ning degree Gymnasiur  | n MINT Teacher Educat                             | ion PLUS, Elite Netw  | ork Bavaria (ENB) (2   | 020)          |
| Master's w                             | ith 1 majo                   | r Computer Science (2018)  |   | urg • generated 19-Apr-2025 «<br>rd Master (120 ECTS) Informa |                        | page 90 / 140 |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Module  | title  |   |   | Abbreviation  |  |
|---|--|---|---|---|--|
| Machin  | e Learning for Natural Langu   | age Processing  |   | 10-l=NLP-182-m01  |  |
| Module  | coordinator  |   | Module offered by   |   |  |
|   | f Studies Informatik (Compute  | or Science)   | Institute of Comput   | or Science  |  |
| ECTS  | Method of grading  | Only after succ. con  | · · · · · ·   |   |  |
| 5   | numerical grade  |   |   |   |  |
| Duratio   |  | Other prerequisites   |   |   |  |
| 1 seme:   |  |   |   |   |  |
| Conten  |  |   |   |   |  |
| ents sta<br>ground<br>almost<br>beddin<br>ke CNN<br>training<br>applica<br>Intende<br>The par<br>and are<br>V (2) +<br>Method<br>ster, inf<br>written<br>If annoi<br>examin<br>prox. 15<br>Langua | d of assessment (type, scope,<br>formation on whether module<br>examination (approx. 60 to 1:<br>unced by the lecturer at the b<br>ation of one candidate each (<br>5 minutes per candidate).<br>ge of assessment: German ar | niques in the area of m<br>tions in Natural Langua<br>rent techniques for lea<br>on this we cover, amon<br>quence architectures. T<br>lso covered in depth. F<br>int analysis, text genera<br>ge on problems and me<br>itable methods for a sp<br>itact hours, language –<br>language — if other th<br>can be chosen to earn<br>20 minutes).<br>eginning of the course,<br>approx. 20 minutes) or | achine learning, as<br>ge Processing. As or<br>rning representation<br>g others, models fro<br>he theoretical found<br>or all models presen<br>ation and machine tr<br>ethods in the area of<br>becific task.<br>- if other than Germa<br>an German, examina<br>a bonus)<br>the written examina | well as their technic<br>ne important buildin<br>s of words, so called<br>m the area of Deep I<br>ations of these mod<br>ted in the lecture, w<br>canslation in practice<br>computational text<br>in)<br>ition offered — if not | al back-<br>g block of<br>d Word Em-<br>earning, li-<br>els, like their<br>e show their<br>processing<br>c every seme- |
|   | ble for bonus  |   |   |   |  |
| Allocat   | ion of places  |   |   |   |  |
|   |  |   |   |   |  |
|   | nal information  |   | 6   | <b>a i i i i i</b>  |  |
| IS, HCI.  |  | Master's programme I  | nformatik (Compute  | r Science, 120 ECTS   | credits): AT,  |
| Worklo  | ad   |   |   |   |  |
| 150 h   |  |   |   |   |  |
| Teachir   | ng cycle   |   |   |   |  |
|   |  |   |   |   |  |
| Referre   | d to in LPO I (examination reg   | gulations for teaching-   | degree programmes)  |   |  |
|   |  |   |   |   |  |
| Module  | e appears in   |   |   |   |  |
|   | 's degree (1 major) Computer   |   |   |   |  |
|   | 's degree (1 major) Computati  |   | 9)  |   |  |
|   | 's degree (1 major) Mathemati  | -   |   |   |  |
|   | 's degree (1 major) Informatio   |   | ion DILLE Elita Natur   | ork Bayaria (END) (a  | 020)   |
|   | 's teaching degree Gymnasiur<br>mentary course MINT Teacher  |   |   |   | 020)   |
|   | th 1 major Computer Science (2018)   |   | urg • generated 19-Apr-2025   |   | page 92 / 140  |
|   |  |   | rd Master (120 ECTS) Informa  |   |  |

| Module title   |   |  | Abbreviation             |   |                        |               |
|--|---|--|--------------------------|---|------------------------|---------------|
| Analysis and Design of Programs  |   |  | 10-I=PA-161-m01          |   |                        |               |
| Modul  | e coord   | inator   |                          | Module offered by   | l                      |               |
|  |   | Chair of Computer Scie                           |                          | Institute of Comput   | or Science             |               |
| ECTS   |   | od of grading                                    | Only after succ. con     |   |                        |               |
|  | 1   | rical grade                                      |                          |   |                        |               |
| 5<br>Duratio   | <u> </u>  | Module level                                     |                          |   |                        |               |
| 1 seme   |   | graduate   | Other prerequisites      |   |                        |               |
| Conter   |   | Siduate  |                          |   |                        |               |
|  |   | sis model creation in                            | software engineering, j  | program quality test  | of programs, proces    | s models      |
|  |   | ning outcomes                                    | soltware engineering, j  | Jogram quality, test  | or programs, proces    | s mouels.     |
|  |   |  |                          | 1 1 1   |                        |               |
| quality  |   | are able to analyse pro                          | grams, to use testing fr | ameworks and metri  | ics as well as to judg | e program     |
| Course   | <b>s</b> (type,   | number of weekly con                             | tact hours, language –   | - if other than Germa   | in)                    |               |
| V (2) +  | Ü (2)   |  |                          |   |                        |               |
| Metho  | d of ass  | essment (type, scope,                            | language — if other th   | an German, examina  | tion offered — if not  | every seme-   |
|  |   |  | can be chosen to earn    |   |                        | ,             |
|  |   | nation (approx. 60 to 1                          |                          |   |                        |               |
|  |   |  | eginning of the course,  |   | <i>,</i>               |               |
|  |   | f one candidate each (<br>es per candidate).     | approx. 20 minutes) or   | an oral examination   | i in groups of 2 cand  | idates (ap-   |
|  |   | ssessment: German ar                             | d/or English             |   |                        |               |
| -  | ble for   |  |                          |   |                        |               |
| Allocat  | tion of p   | olaces   |                          |   |                        |               |
|  |   |  |                          |   |                        |               |
| Additio  | onal info   | ormation   |                          |   |                        |               |
| Focuse<br>SE,IS,E  |   | able for students of the                         | Master's programme I     | nformatik (Compute  | r Science, 120 ECTS (  | credits):     |
| Worklo   |   |  |                          |   |                        |               |
| 150 h  |   |  |                          |   |                        |               |
|  | ng cycl   | 9  |                          |   |                        |               |
|  |   |  |                          |   |                        |               |
| Referre  | ed to in  | LPOI (examination reg                            | gulations for teaching-  | degree programmes)  | I                      |               |
|  |   |  | <u> </u>                 | <u> </u>  |                        |               |
| Modul  | e appea   | rs in  |                          |   |                        |               |
|  |   | ee (1 major) Computer :                          | Science (2016)           |   |                        |               |
|  | -   | ee (1 major) Mathemati                           |                          |   |                        |               |
| Master   | 's degre  | ee (1 major) Physics (20                         | 016)                     |   |                        |               |
| Master   | Master's degree (1 major) Nanostructure Technology (2016)   |  |                          |   |                        |               |
| Master's degree (1 major) Computational Mathematics (2016)   |   |  |                          |   |                        |               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |   |  |                          |   |                        |               |
|  | Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)                            |  |                          |   |                        |               |
|  | Master's degree (1 major) Computer Science (2017)   |  |                          |   |                        |               |
|  | Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019) |  |                          |   |                        |               |
|  | -   | ee (1 major) Computati<br>ee (1 major) Mathemati |                          | 9)  |                        |               |
|  | -   | ee (1 major) Mathematio                          | -                        |   |                        |               |
|  |   |  |                          |   |                        |               |
| Master's w   | ith 1 major   | Computer Science (2018)                          |                          | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |                        | page 93 / 140 |

Master's degree (1 major) Nanostructure Technology (2020) Master's degree (1 major) Physics (2020) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Physics International (2020) Master's degree (1 major) Quantum Engineering (2020) Master's degree (1 major) Quantum Technology (2021) Master's degree (1 major) Computational Mathematics (2022)

Master's degree (1 major) Mathematics (2022)

| Module t   |   |                          |  | Abbreviation          |               |  |
|--|---|--------------------------|--|-----------------------|---------------|--|
| Performa   | ance Engineering & Benchm   | stems                    | 10-I=PEB-161-m01   |                       |               |  |
| Module coordinator   |   |                          | Module offered by  | <u> </u>              |               |  |
| holder of  | f the Chair of Computer Scie  | nce II                   | Institute of Comput  | er Science            |               |  |
|  | Method of grading   | Only after succ. com     |  |                       |               |  |
|  | numerical grade   |                          |  |                       |               |  |
| Duration   |   | Other prerequisites      |  |                       |               |  |
| 1 semest   |   |                          |  |                       |               |  |
| Contents   |   | I                        |  |                       |               |  |
| Introduct  | tion to performance enginee<br>nchmarking of commercial s   |                          |  |                       |               |  |
|  | l learning outcomes   |                          | 0  |                       |               |  |
| The stude ment tec   | ents possess a fundamenta<br>hniques, multi-factorial vari<br>etworks, modelling methods  | ance analysis, data ana  | lysis with R, benchr   | nark approaches, mo   |               |  |
| Courses  | (type, number of weekly cor   | itact hours, language —  | if other than Germa  | ın)                   |               |  |
| V (2) + Ü  | (2)   |                          |  |                       |               |  |
|  | <b>of assessment</b> (type, scope,<br>rmation on whether module   |                          |  | tion offered — if not | every seme-   |  |
| examinat<br>prox. 15 r<br>Language   | nced by the lecturer at the b<br>tion of one candidate each (<br>minutes per candidate).<br>e of assessment: German ar<br>e for bonus | approx. 20 minutes) or   |  |                       |               |  |
| Allocatio  | n of places   |                          |  |                       |               |  |
|  |   |                          |  |                       |               |  |
| Addition   | al information  |                          |  |                       |               |  |
|  | available for students of the   | Master's programme li    | nformatik (Compute   | r Science, 120 ECTS o | credits):     |  |
| Workload   |   |                          |  |                       |               |  |
| 150 h  |   |                          |  |                       |               |  |
| Teaching   | revelo  |                          |  |                       |               |  |
| reaching   |   |                          |  |                       |               |  |
|  |   |                          | · · · · · · · · · · · · · · · · · · ·                        |                       |               |  |
| Kererred   | to in LPO I (examination re   | guiations for teaching-c | iegree programmes)   |                       |               |  |
|  |   |                          |  |                       |               |  |
|  | appears in  |                          |  |                       |               |  |
|  | degree (1 major) Computer   |                          |  |                       |               |  |
| Master's degree (1 major) Mathematics (2016)   |   |                          |  |                       |               |  |
| Master's degree (1 major) Computational Mathematics (2016)   |   |                          |  |                       |               |  |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |   |                          |  |                       |               |  |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)               |   |                          |  |                       |               |  |
|  | degree (1 major) Computer   |                          |  |                       |               |  |
| Master's degree (1 major) Computer Science (2018)  |   |                          |  |                       |               |  |
| Master's degree (1 major) Computational Mathematics (2019)   |   |                          |  |                       |               |  |
|  | degree (1 major) Mathemat<br>degree (1 major) Informatio  |                          |  |                       |               |  |
| Master's with  | 1 major Computer Science (2018)   |                          | rg • generated 19-Apr-2025 v<br>rd Master (120 ECTS) Informa |                       | page 95 / 140 |  |

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020)

|                              |  |   |  |                       | Abbreviation  |  |
|------------------------------|--|---|--|-----------------------|---|--|
| Probab                       | ilistic I  | nference  |  |                       | 10-l=Pl-172-m01   |  |
| Module coordinator           |  |   |  | Module offered by     |   |  |
| Dean o                       | f Studie   | es Informatik (Computer   | Science)                                       | Institute of Comput   | er Science  |  |
| ECTS                         |  | od of grading   | Only after succ. con                           | pl. of module(s)      |   |  |
| 5                            | nume   | rical grade   |  |                       |   |  |
| Duratio                      | on   | Module level  | Other prerequisites                            |                       |   |  |
| 1 seme                       | ster   | graduate  |  |                       |   |  |
| Conten                       | ts   |   |  |                       |   |  |
| ference                      | e in Tree  |   | Learning Markov Ran                            | dom Fields, Approxi   | kov Networks, Factor Graphs, In-<br>mate Inference, Sampling, Sup-  |  |
| Intende                      | ed learı   | ning outcomes   |  |                       |   |  |
| The stu<br>method            |  | are able to master probal   | pilistic inference and                         | to program small py   | thon programs for applying these                                    |  |
| Course                       | <b>s</b> (type   | , number of weekly conta  | ct hours, language –                           | - if other than Germa | in)   |  |
| V (2) +                      | Ü (2)  |   |  |                       |   |  |
|                              |  | s <b>essment</b> (type, scope, la<br>on on whether module ca            |  |                       | tion offered — if not every seme-                                   |  |
| lf anno<br>examin<br>prox. 1 | unced l<br>ation o<br>5 minut<br>ge of a   | f one candidate each (ar<br>es per candidate).<br>ssessment: German and | inning of the course,<br>pprox. 20 minutes) or |                       | tion may be replaced by an oral<br>i in groups of 2 candidates (ap- |  |
| Allocat                      | ion of p   | olaces  |  |                       |   |  |
|                              |  |   |  |                       |   |  |
| Additio                      | nal inf  | ormation  |  |                       |   |  |
| Focuse<br>IT, IS, ⊦          |  | able for students of the N  | laster's programme l                           | nformatik (Computer   | r Science, 120 ECTS credits): AT,                                   |  |
| Worklo                       | ad   |   |  |                       |   |  |
| 150 h                        |  |   |  |                       |   |  |
| Teachi                       | Teaching cycle   |   |  |                       |   |  |
|                              |  |   |  |                       |   |  |
| Referre                      | <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)                   |   |  |                       |   |  |
|                              |  |   |  |                       |   |  |
| Module                       | e appea  | irs in  |  |                       |   |  |
|                              | Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018) |   |  |                       |   |  |
|                              |  | , , , , , , , , , , , , , , , , , , ,                                   | × /  |                       |   |  |

| mouul   | e title  |  |   |   | Abbreviation   |                                   |
|---|--|--|---|---|--|-----------------------------------|
| Profes  | sional Project Managem   | ent  |   |   | 10-I=PM-182-m01  |                                   |
| Module coordinator  |  |  |   | Module offered by   |  |                                   |
| holder  | of the Chair of Compute  | r Science  | e   | Institute of Comput   | er Science   |                                   |
| ECTS  | Method of grading  |  | Only after succ. cor  | npl. of module(s)   |  |                                   |
| 5   | numerical grade  |  |   |   |  |                                   |
| Duratio   | on Module level  |  | Other prerequisites   | i   |  |                                   |
| 1 seme  | ester graduate   |  | We recommend con  | npleting module 10-l=   | =PRJAK in parallel.  |                                   |
| Conten  | its  |  |   |   |  |                                   |
| manag<br>munica<br>ment; o<br>quality<br>prograf<br>project<br>Intendo  | ement, initialisation, de<br>ation and marketing, pro<br>conflict and crisis manage<br>management, work tech<br>m management, multipro<br>ts; agile project manager<br>ed learning outcomes  | finition, p<br>ject orga<br>gement, o<br>nniques,<br>oject man<br>ment/SCI   | planning, execution<br>nisation, team build<br>change and claim m<br>methods and tools;<br>nagement, project p<br>RUM, combination c  | /control, finishing of<br>ling and developmen<br>anagement; contract<br>leadership and socia<br>ortfolio management<br>of classic and agile m |  | om-<br>ge-<br>ent,<br>nt,<br>vare |
| fessior<br>plan, c  | nal project management.<br>ontrol and review projec  | They are<br>ts.  | e familiar with the cr  | itical success criteria   | tion management and/or pro   |                                   |
|   | <b>s</b> (type, number of week   | ly contac  | et nours, language -  | - II other than Germa   | n)   |                                   |
| V (4)   |  |  |   |   |  |                                   |
|   |  |  |   |   |  |                                   |
| ster, in<br>written   | formation on whether m<br>examination (approx. 6   | odule ca<br>o to 120   | n be chosen to earn<br>minutes).  | a bonus)  | tion offered — if not every ser  |                                   |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua   | formation on whether m<br>examination (approx. 6<br>unced by the lecturer at   | odule ca<br>o to 120<br>the begi<br>each (app<br>).  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of  | a bonus)<br>the written examina   | tion offered — if not every ser<br>tion may be replaced by an or<br>in groups of 2 candidates (a | ral                               |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita  | formation on whether m<br>examination (approx. 6<br>unced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ  | odule ca<br>o to 120<br>the begi<br>each (app<br>).  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of  | a bonus)<br>the written examina   | tion may be replaced by an o   | ral                               |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus  | odule ca<br>o to 120<br>the begi<br>each (app<br>).  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of  | a bonus)<br>the written examina   | tion may be replaced by an o   | ral                               |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus  | odule ca<br>o to 120<br>the begi<br>each (app<br>).  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of  | a bonus)<br>the written examina   | tion may be replaced by an o   | ral                               |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places  | odule ca<br>o to 120<br>the begi<br>each (app<br>).<br>nan and/  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English  | a bonus)<br>the written examina<br>an oral examination  | tion may be replaced by an o   | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.   | odule ca<br>o to 120<br>the begi<br>each (app<br>).<br>nan and/  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English  | a bonus)<br>the written examina<br>an oral examination  | tion may be replaced by an o<br>in groups of 2 candidates (a                                     | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.   | odule ca<br>o to 120<br>the begi<br>each (app<br>).<br>nan and/  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English  | a bonus)<br>the written examina<br>an oral examination  | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places  | odule ca<br>o to 120<br>the begi<br>each (app<br>).<br>nan and/  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English  | a bonus)<br>the written examina<br>an oral examination  | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.   | odule ca<br>o to 120<br>the begi<br>each (app<br>).<br>nan and/  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English  | a bonus)<br>the written examina<br>an oral examination  | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.<br>oad  | odule ca<br>o to 120<br>the begin<br>each (app<br>).<br>nan and/o  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l   | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer   | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places  | odule ca<br>o to 120<br>the begin<br>each (app<br>).<br>nan and/o  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l   | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer   | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>bnal information<br>es available for students<br>ES, LR, HCI, GE.<br>bad<br>ng cycle<br>ed to in LPO I (examinat  | odule ca<br>o to 120<br>the begin<br>each (app<br>).<br>nan and/o  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l   | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer   | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br><br>Module  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.<br>oad<br>ng cycle<br>ed to in LPO I (examinat  | odule ca<br>o to 120<br>the begin<br>each (app).<br>nan and/<br>of the Ma<br>ion regul   | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-   | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer   | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br><br>Module   | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>bnal information<br>es available for students<br>ES, LR, HCI, GE.<br>bad<br>ng cycle<br>ed to in LPO I (examinat  | odule ca<br>o to 120<br>the begin<br>each (app)).<br>nan and/o<br>of the Ma<br>ion regul   | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-<br>ence (2018)  | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer   | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br>Master<br>Master  | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>of minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>bonal information<br>es available for students<br>ES, LR, HCI, GE.<br>bad<br>ng cycle<br>ed to in LPO I (examinat<br>e appears in<br>"s degree (1 major) Com   | odule ca<br>o to 120<br>the begin<br>each (app)).<br>nan and/o<br>of the Ma<br>of the Ma<br>ion regul  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-<br>ence (2018)<br>(2018)  | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer<br>degree programmes)                                       | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br><br>Modulo<br>Master<br>Master<br>Master<br>Master              | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>5 minutes per candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>onal information<br>es available for students<br>ES, LR, HCI, GE.<br>oad<br>ad<br>age cycle<br>ed to in LPO I (examinat<br>e appears in<br>d's degree (1 major) Comp<br>d's degree (1 major) Comp<br>d's degree (1 major) Comp<br>d's degree (1 major) Math | odule ca<br>o to 120<br>the begin<br>each (app)).<br>nan and/<br>of the Ma<br>of the Ma<br>ion regul<br>puter Sci-<br>agement<br>putationa<br>rematics   | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-<br>ence (2018)<br>(2018)<br>al Mathematics (201<br>(2019)   | a bonus)<br>the written examination<br>an oral examination<br>nformatik (Computer<br>degree programmes)                                       | tion may be replaced by an or<br>in groups of 2 candidates (a                                    | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br><br>Additic<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br>Master<br>Master<br>Master<br>Master<br>Master       | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>bonal information<br>es available for students<br>ES, LR, HCI, GE.<br>bad<br>ng cycle<br>ed to in LPO I (examinat<br>e appears in<br>d's degree (1 major) Comp<br>d's degree (1 major) Comp<br>d's degree (1 major) Math<br>d's degree (1 major) Math<br>d's degree (1 major) Infor    | odule ca<br>o to 120<br>the begineration (app)<br>and and/<br>of the Ma<br>of the Ma<br>ion reguler<br>puter Sci-<br>agement<br>putationa<br>mation S  | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-<br>ence (2018)<br>(2018)<br>al Mathematics (201<br>(2019)<br>systems (2019)                       | a bonus) the written examination an oral examination nformatik (Computer degree programmes) 9)  | tion may be replaced by an or<br>in groups of 2 candidates (a)                                   | ral<br>D-                         |
| ster, in<br>written<br>If anno<br>examir<br>prox. 1<br>Langua<br>credita<br>Allocat<br>Allocat<br>Focuse<br>IT, IS, E<br>Worklo<br>150 h<br>Teachi<br><br>Referre<br>Master<br>Master<br>Master<br>Master<br>Master<br>Master | formation on whether m<br>examination (approx. 6<br>bunced by the lecturer at<br>nation of one candidate<br>age of assessment: Germ<br>ble for bonus<br>tion of places<br>bonal information<br>es available for students<br>ES, LR, HCI, GE.<br>bad<br>ng cycle<br>ed to in LPO I (examinat<br>e appears in<br>d's degree (1 major) Comp<br>d's degree (1 major) Comp<br>d's degree (1 major) Math<br>d's degree (1 major) Math<br>d's degree (1 major) Infor    | odule ca<br>o to 120<br>the begin<br>each (app<br>).<br>nan and/<br>of the Ma<br>of the Ma<br>of the Ma<br>ion regul<br>puter Sci-<br>agement<br>puter Sci-<br>agement<br>putation a<br>mation S<br>masium M | n be chosen to earn<br>minutes).<br>nning of the course,<br>prox. 20 minutes) of<br>or English<br>aster's programme l<br>ations for teaching-<br>ence (2018)<br>(2018)<br>al Mathematics (201<br>(2019)<br>ystems (2019)<br>AINT Teacher Educat | a bonus) the written examination an oral examination nformatik (Computer degree programmes) 9)  | tion may be replaced by an or<br>in groups of 2 candidates (a)<br>Science, 120 ECTS credits): S  | ral<br>D-                         |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) exchange program Business Management and Economics (2022)

| Module                        | e title                                |  |  |                       | Abbreviation  |
|-------------------------------|--|--|--|-----------------------|---|
| Progra                        | mming                                  | with neural nets   |  |                       | 10-I=PNN-182-m01  |
| Module                        | e coord                                | inator   |  | Module offered by     |   |
| holder                        | ofthe                                  | Chair of Computer Scienc   | e VI   | Institute of Comput   | er Science  |
| ECTS                          | Methe                                  | od of grading  | Only after succ. com                           | pl. of module(s)      |   |
| 5                             | nume                                   | rical grade  |  |                       |   |
| Duratio                       | on                                     | Module level   | Other prerequisites                            |                       |   |
| 1 seme                        | ster                                   | graduate   |  |                       |   |
| Conten                        | ts                                     |  |  |                       |   |
|                               |  | NN, implementation of in res, among others in the                          |  |                       | and LSTMs, practical example for                                      |
| Intende                       | ed lear                                | ning outcomes  |  |                       |   |
| Knowle<br>and ho              | dge ab<br>w they                       | out possible application   | ools like Tensorflow/                          |                       | hitectures (eg. FCN, CNN, LSTM)<br>gram network structures from lite- |
| Course                        | <b>s</b> (type                         | , number of weekly conta   | ct hours, language —                           | - if other than Germa | in)   |
| V (2) +                       | Ü (2)                                  |  |  |                       |   |
|                               |  | sessment (type, scope, la<br>ion on whether module ca                      |  |                       | tion offered — if not every seme-                                     |
| lf anno<br>examin<br>prox. 15 | unced<br>ation o<br>5 minut<br>ge of a | of one candidate each (ap<br>tes per candidate).<br>ssessment: German and, | inning of the course,<br>pprox. 20 minutes) or |                       | tion may be replaced by an oral<br>in groups of 2 candidates (ap-     |
| Allocat                       | ion of                                 | places   |  |                       |   |
|                               |  |  |  |                       |   |
| Additio                       | nal inf                                | ormation   |  |                       |   |
|                               | s availa                               | able for students of the N   | laster's programme li                          | nformatik (Computer   | r Science, 120 ECTS credits): SE,                                     |
| Worklo                        | ad                                     |  |  |                       |   |
| 150 h                         |  |  |  |                       |   |
| Teachi                        | ng cvcl                                | e  |  |                       |   |
|                               | <u> </u>                               |  |  |                       |   |
| Poforro                       | d to in                                | LPOI (examination regu   | lations for teaching                           | legree programmes)    |   |
| Referre                       |  |  |  |                       |   |
|                               |  | •  |  |                       |   |
| Module                        |  |  | : (  |                       |   |
|                               | -                                      | ee (1 major) Computer Sc   |  |                       |   |
|                               | -                                      | ee (1 major) Information S<br>hing degree Gymnasium I                      |  | ion PLUS Flite Notw   | ork Bayaria (ENB) (2020)  |
|                               |  | ry course MINT Teacher E   |  |                       |   |
| 1 12 12                       |  |  | -,   |                       |   |
|                               |  |  |  |                       |   |

| Modul   | e title  |   |                       |                      | Abbreviation                      |  |
|---|--|---|-----------------------|----------------------|-----------------------------------|--|
| Practical course - Current Topics in Computer Science         10-I=PRAK-161-m01 |  |   |                       |                      | 10-I=PRAK-161-m01                 |  |
| Modul   | e coord  | inator                                    |                       | Module offered by    |                                   |  |
|   |  | es Informatik (Computer :                 | Science)              | Institute of Comput  | er Science                        |  |
| ECTS  | -  | od of grading                             | Only after succ. con  | · ·                  |                                   |  |
| 10  | (not)  | successfully completed                    |                       |                      |                                   |  |
| Duratio   | on   | Module level                              | Other prerequisites   |                      |                                   |  |
| 1 seme  | ester  | graduate                                  |                       |                      |                                   |  |
| Conter  | nts  |   |                       |                      |                                   |  |
| Comple  | etion o  | f a practical task.                       |                       |                      |                                   |  |
| Intend  | ed lear  | ning outcomes                             |                       |                      |                                   |  |
|   | -  | allows participants to wo                 | rk on a problem in co | mputer science in te | eams.                             |  |
|   |  | , number of weekly conta                  |                       |                      |                                   |  |
| P (6)   | - (-)  | ,   |                       |                      |                                   |  |
|   | age of a<br>tion of  | issessment: German and,<br>places         | /or English           |                      |                                   |  |
|   |  |   |                       |                      |                                   |  |
| Additio   | onal inf   | ormation                                  |                       |                      |                                   |  |
|   |  | able for students of the N<br>LR, HCI, GE | laster's programme l  | nformatik (Computer  | r Science, 120 ECTS credits): AT, |  |
| Worklo  | ad   |   |                       |                      |                                   |  |
| 300 h   |  |   |                       |                      |                                   |  |
| Teachi  | ng cycl  | e   |                       |                      |                                   |  |
|   |  |   |                       |                      |                                   |  |
| Referre   | ed to in   | LPO I (examination regu                   | lations for teaching- | degree programmes)   |                                   |  |
|   |  |   |                       |                      |                                   |  |
| Modul   | e appea  | ars in                                    |                       |                      |                                   |  |
| Master  | r's degr   | ee (1 major) Computer Sc                  | ience (2016)          |                      |                                   |  |
| Master's degree (1 major) Computer Science (2017)                               |  |   |                       |                      |                                   |  |
|   | Master's degree (1 major) Computer Science (2018)  |   |                       |                      |                                   |  |
|   | Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) |   |                       |                      |                                   |  |
| Supple  | ementa   | ry course MINT Teacher E                  | ducation PLUS, Elite  | Network Bavaria (EN  | B) (2020)                         |  |

| Module title                                      |                                 |  |  | Abbreviation                                  |  |
|---|---------------------------------|--|--|---|--|
| Project - Current Topics in Computer Science      |                                 |  | 10-I=PRJAK-162-m01   |   |  |
| Module  | coord                           | inator   |  | Module offered by                             |  |
| Dean of   | fStudi                          | es Informatik (Computer S                                  | Science)   | Institute of Comput                           | er Science   |
| ECTS  |                                 | od of grading  | Only after succ. com   | pl. of module(s)                              |  |
| 5   | nume                            | rical grade  |  |   |  |
| Duratio   | n                               | Module level   | Other prerequisites  |   |  |
| 1 seme  | ster                            | graduate   |  |   |  |
| Conten  | ts                              |  |  |   |  |
| Comple  | tion of                         | a project task (in Teams)                                  | ).   |   |  |
| Intende   | ed lear                         | ning outcomes  |  |   |  |
| The pro   | ject all                        | ows participants to work                                   | on a problem in com  | puter science in tea                          | ms.  |
| Course  | <b>s</b> (type                  | , number of weekly conta                                   | ct hours, language —   | if other than Germa                           | n)   |
| P (4)   |                                 |  |  |   |  |
|   |                                 | <b>essment</b> (type, scope, la<br>on on whether module ca |  |   | tion offered — if not every seme-                        |
| Each pr<br>same to<br>Langua                      | oject is<br>opic. As<br>ge of a |  | he project will not be<br>, only be offered for t<br>/or English | repeated; there will<br>he project offered in | not be another project with the the respective semester. |
| Allocat   | ion of p                        | olaces   |  |   |  |
|   |                                 |  |  |   |  |
| Additio   | nal inf                         | ormation   |  |   |  |
|   |                                 | able for students of the N<br>LR, HCI, GE.                 | laster's programme Ir  | nformatik (Computer                           | Science, 120 ECTS credits): AT,                          |
| Worklo  | ad                              |  |  |   |  |
| 150 h   |                                 |  |  |   |  |
| Teachir   | ıg cycl                         | e  |  |   |  |
|   |                                 |  |  |   |  |
| Referre   | d to in                         | LPOI (examination regu                                     | lations for teaching-d   | legree programmes)                            |  |
|   |                                 |  |  |   |  |
| Module  | appea                           | urs in   |  |   |  |
| Master'   | s degr                          | ee (1 major) Computer Sc                                   | ience (2016)   |   |  |
| Master's degree (1 major) Computer Science (2017) |                                 |  |  |   |  |
| Master's degree (1 major) Computer Science (2018) |                                 |  |  |   |  |
|   | -                               | ee (1 major) Management                                    |  |   |  |
|   | -                               | ee (1 major) Computation                                   | -  | 9)  |  |
|   | -                               | ee (1 major) Mathematics                                   | -  |   |  |
|   |                                 | ee (1 major) Media Comm                                    |  |   |  |
|   |                                 | ee (1 major) Information S                                 |  |   |  |
|   |                                 | ning degree Gymnasium I<br>Ty course MINT Teacher Eo       |  |   |  |
| Supple  | mentu                           | y source mintri reacher Et                                 |  |   |  |

| Practic Lourse - Rocket Engineering and Payloads       10-l=PRT-182-m01         Module offered by       Institute of Computer Science         Institute of Computer Science       Institute of Computer Science         Institute Science       Institute of Computer Science         Institute Science       Institute of Computer Science         Institute Science       Institute Science         Institute Science </th <th>Module</th> <th>e title</th> <th></th> <th></th> <th></th> <th>Abbreviation</th>  | Module                       | e title            |   |   |  | Abbreviation   |
|--|------------------------------|--------------------|---|---|--|--|
| holder of the Chair of Computer Science VIII       Institute of Computer Science         ECTS       Method of grading       Only after succ. compl. of module(s)         10       (not) successfully completed          Duration       Module level       Other prerequisites         1 semester       graduate          Contents           In this internship, students are supposed to acquire practical experience in the design, building, execution and analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.         Intended learning outcomes          The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowledge about to cket science, including launch preparations as well as the execution. They are able to analyse the ele mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects.         Courses (type, number of weekly contact hours, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)         placement report (4 to 5 pages) and presentation of results (1s to 30 minutes)         Language of assessment: German and/or English         Allocation of places               Additio  | Practic                      | al cour            | se - Rocket Engineering a                               |   | 10-l=PRT-182-m01                               |  |
| ECTS         Method of grading         Only after succ. compl. of module(s)           10         (not) successfully completed            Duration         Module level         Other prerequisites           1 semester         graduate            Contents             In this internship, students are supposed to acquire practical experience in the design, building, execution and analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.           Intended learning outcomes            The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowledge about rocket science, including launch preparations as well as the execution. They are able to analyse the ele mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects.           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 can be chosen to earn a bonus)           placement report (4 to 5 pages) and presentation of results (1s to 30 minutes)           Language of assessment. German and/or English           Alditional information           Focuses available for students of the  | Module coordinator           |                    |   |   | Module offered by                              | · · · · · · · · · · · · · · · · · · ·                                    |
| 10       (not) successfully completed  | holder                       | of the (           | Chair of Computer Scienc                                | e VIII                                    | Institute of Comput                            | er Science   |
| Duration         Module level         Other prerequisites           1 semester         graduate            Contents         In this internship, students are supposed to acquire practical experience in the design, building, execution and analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.           Intendel learning outcomes         The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowledge about to excet science, including launch preparations as well as the execution. They are able to analyse the ele mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects.           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 can be chosen to earn a bonus)         P lacement report (4 to 5 pages) and presentation of results (15 to 30 minutes)           Language of assessment: German and/or English         Additional information           Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).           Workload         300 h         Teaching cycle            Referred to in LPO 1 (examination regulations for teaching-degree | ECTS                         |                    |   | Only after succ. com                      | pl. of module(s)                               |  |
| 1 semester       graduate          Contents       In this internship, students are supposed to acquire practical experience in the design, building, execution and analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.         Intended learning outcomes       Intended learning outcomes         The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowledge about rocket science, including launch preparations as well as the execution. They are able to analyse the elementary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects.         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 can be chosen to earn a bonus)       Language of assessment: German and/or English         Allocation of places              Morkload              Morkload                  Additional information                  <  | 10                           | (not) s            | successfully completed                                  |   |  |  |
| Contents         In this internship, students are supposed to acquire practical experience in the design, building, execution and analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.         Intended learning outcomes       Intended learning outcomes is a superiment in the design of spacecraft experiments, fundamental knowledge about the design of spacecraft experiments, fundamental knowledge about tocket science, including launch preparations as well as the execution. They are able to analyse the ede mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects.         Courses (type, number of weekly contact hours, language — if other than German)       P         P (6)       Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module can be chosen to earn a bonus)         placement report (4 to 5 pages) and presentation of results (15 to 30 minutes)         Language of assessment: German and/or English         Additional information         Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).         Workload         300 h         Teaching cycle            Method or in LPO I (examination regulations for teaching-degree programmes)   | Duratio                      | n                  |   | Other prerequisites                       |  |  |
| In this internship, students are supposed to acquire practical experience in the design, building, execution and<br>analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads.<br>Intended learning outcomes<br>The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowled-<br>ge about rocket science, including launch preparations as well as the execution. They are able to analyse the ele<br>mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With<br>the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger pro-<br>jects.<br>Courses (type, number of weekly contact hours, language — if other than German)<br>P (6)<br>Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>placement report (4 to 5 pages) and presentation of results (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Allocation of places<br><br>Additional information<br>Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR.<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).<br>Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in  | 1 seme                       | ster               | graduate  |   |  |  |
| analysis of rocket experiments (including their payload). The goal is the design, building and testing of rocket experiments and their payloads. Intended learning outcomes The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowled- ge about rocket science, including launch preparations as well as the execution. They are able to analyse the ele ge about rocket science, including their payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger pro- jects. 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 seme- ster, information on whether module can be chosen to earn a bonus) placement report (4 to 5 pages) and presentation of results (15 to 30 minutes) Language of assessment: German and/or English Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   | Conten                       | ts                 |   |   |  |  |
| The students gain fundamental knowledge about the design of spacecraft experiments, fundamental knowled-<br>ge about rocket science, including launch preparations as well as the execution. They are able to analyse the ele<br>mentary design aspects of rocket payloads, pose according requirements and respects those in the design. With<br>the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger pro-<br>jects.<br>Courses (type, number of weekly contact hours, language — if other than German)<br>P (6)<br>Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>placement report (4 to 5 pages) and presentation of results (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Allocation of places<br><br>Additional information<br>Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR.<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).<br>Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in  | analysi                      | s of roo           | cket experiments (includi                               |   |  |  |
| ge about rocket science, including launch preparations as well as the execution. They are able to analyse the elementary design aspects of rocket payloads, pose according requirements and respects those in the design. With the aid of the acquired methodic knowledge, they are able to apply dedicated tools and method in bigger projects. 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 can be chosen to earn a bonus) placement report (4 to 5 pages) and presentation of results (15 to 30 minutes) Language of assessment: German and/or English Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   | Intende                      | ed lear            | ning outcomes   |   |  |  |
| P (6)  Method of assessment (type, scope, language — if other than German, examination offered — if not every seme- ster, information on whether module can be chosen to earn a bonus) placement report (4 to 5 pages) and presentation of results (15 to 30 minutes) Language of assessment: German and/or English  Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in  | ge abou<br>mentar<br>the aid | ut rock<br>y desig | et science, including laur<br>n aspects of rocket paylo | nch preparations as woods, pose according | vell as the execution requirements and re      | . They are able to analyse the ele-<br>espects those in the design. With |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>placement report (4 to 5 pages) and presentation of results (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Allocation of places<br><br>Additional information<br>Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR.<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).<br>Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in  | Course                       | <b>s</b> (type     | , number of weekly conta                                | ct hours, language —                      | if other than Germa                            | in)  |
| ster, information on whether module can be chosen to earn a bonus)  placement report (4 to 5 pages) and presentation of results (15 to 30 minutes) Language of assessment: German and/or English  Allocation of places  Additional information  Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).  Workload 300 h  Teaching cycle  Referred to in LPO I (examination regulations for teaching-degree programmes)  Module appears in   | P (6)                        |                    |   |   |  |  |
| Language of assessment: German and/or English Allocation of places Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   |                              |                    |   |   |  | tion offered — if not every seme-  |
| Additional information Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR. Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in  | •                            | •                  |   |   | (15 to 30 minutes)                             |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR.<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).<br>Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in   | Allocat                      | ion of <b>j</b>    | olaces  |   |  |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): LR.<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).<br>Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in   |                              |                    |   |   |  |  |
| Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions). Workload 300 h Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   | Additio                      | nal inf            | ormation  |   |  |  |
| Workload<br>300 h<br>Teaching cycle<br><br>Referred to in LPO I (examination regulations for teaching-degree programmes)<br><br>Module appears in  |                              |                    |   |   |  | r Science, 120 ECTS credits): LR.  |
| Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   | Worklo                       | ad                 |   |   |  |  |
| Teaching cycle Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in   | 300 h                        |                    |   |   |  |  |
| Referred to in LPO I (examination regulations for teaching-degree programmes) Module appears in  | -                            | ng cvcl            | e   |   |  |  |
|  |                              | <u> </u>           |   |   |  |  |
|  | Referre                      | d to in            | LPOI (examination regu                                  | lations for teaching-                     | legree programmes)                             |  |
|  |                              |                    |   |   | - 0· p· - 0· · · · · · · · · · · · · · · · · · |  |
|  | Module                       | e appea            | ars in  |   |  |  |
| אמאנר א מכבוכנ (ד וומןטו) לטווףמנכו אוכווכב (בטוט)   |                              |                    |   | ience (2018)                              |  |  |

| Module                       | e title  |   |   |                        | Abbreviation  |  |  |
|------------------------------|--|---|---|------------------------|---|--|--|
| Computer Architecture        |  |   |   |                        | 10-l=RAK-161-m01  |  |  |
| Module                       | e coord  | inator  |   | Module offered by      |   |  |  |
| Dean o                       | f Studi  | es Informatik (Computer :   | Science)                                | Institute of Comput    | er Science  |  |  |
| ECTS                         |  | od of grading   | Only after succ. con                    | npl. of module(s)      |   |  |  |
| 5                            | nume   | rical grade   |   |                        |   |  |  |
| Duratio                      | on   | Module level  | Other prerequisites                     | i                      |   |  |  |
| 1 seme                       | ster   | graduate  |   |                        |   |  |  |
| Conten                       | ts   |   |   |                        |   |  |  |
|                              |  | t architectures, command<br>vector processors, multi-c  |   | pipelining, statical a | and dynamic instruction schedu-                                   |  |  |
| Intende                      | ed lear  | ning outcomes   |   |                        |   |  |  |
|                              |  | naster the most importan operating systems.   | nt techniques to desi                   | gn fast computers as   | s well as their interaction with                                  |  |  |
| Course                       | <b>s</b> (type   | , number of weekly conta  | ct hours, language –                    | - if other than Germa  | ın)   |  |  |
| V (2) +                      | Ü (2)  |   |   |                        |   |  |  |
|                              |  | s <b>essment</b> (type, scope, la<br>on on whether module ca  |   |                        | tion offered — if not every seme-                                 |  |  |
| examin<br>prox. 19<br>Separa | ation c<br>5 minut<br>te writt<br>1ge of a   | f one candidate each (ar<br>es per candidate).<br>en examination for Mast<br>ssessment: German and, | oprox. 20 minutes) or<br>er's students. |                        | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |  |  |
| Allocat                      | ion of p   | olaces  |   |                        |   |  |  |
|                              |  |   |   |                        |   |  |  |
| Additio                      | nal inf  | ormation  |   |                        |   |  |  |
| Focuse<br>IT, ES, I          |  | able for students of the N  | laster's programme l                    | nformatik (Computer    | r Science, 120 ECTS credits): SE,                                 |  |  |
| Worklo                       | ad   |   |   |                        |   |  |  |
| 150 h                        |  |   |   |                        |   |  |  |
| Teachi                       | ng cycl  | e   |   |                        |   |  |  |
|                              |  |   |   |                        |   |  |  |
| Referre                      | <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes) |   |   |                        |   |  |  |
|                              | -  |   |   |                        |   |  |  |
| Module                       | e appea  | nrs in  |   |                        |   |  |  |
|                              |  | ee (1 major) Computer Sc  | ience (2016)                            |                        |   |  |  |
|                              |  | ee (1 major) Computer Sc  |   |                        |   |  |  |
|                              |  | ee (1 major) Computer Sc  |   |                        |   |  |  |
| Master                       | Master's degree (1 major) Computer Science (2021)                                    |   |   |                        |   |  |  |

| Module title   |   |   |                               |  | Abbreviation           |                |
|--|---|---|-------------------------------|--|------------------------|----------------|
| Computer Arithmetic 10-I=RAM-161-m01   |   |   |                               |  |                        |                |
| Module coordinator   |   |   |                               | Module offered by  |                        |                |
| holder of the Chair of Computer Science II   |   |   | Institute of Computer Science |  |                        |                |
| ECTS   |   | od of grading   | Only after succ. con          | · · ·  |                        |                |
|  | ·   | rical grade   |                               |  |                        |                |
| 5  | L   |   |                               |  |                        |                |
| Duration   |   | Module level graduate   | Other prerequisites           |  |                        |                |
| Conten   |   | Sidduite  |                               |  |                        |                |
|  |   | nerical computation, ras  | ster and rounding, def        | inition and impleme  | ntation of computation | onal arithme-  |
|  |   | ning outcomes   |                               |  |                        |                |
|  |   | oossess knowledge abo   | ut the spaces of nume         | erical computation r   | aster and roundings    | definition     |
|  | plemer  | itation of computationa   |                               |  |                        |                |
| Course   | <b>s</b> (type  | , number of weekly con  | act hours, language –         | - if other than Germa  | n)                     |                |
| V (2) +  | Ü (2)   |   |                               |  |                        |                |
|  |   | essment (type, scope, on on whether module  |                               |  | tion offered — if not  | every seme-    |
| examir<br>prox. 1<br>Langua  | nation o<br>5 minut   | by the lecturer at the be<br>f one candidate each (a<br>es per candidate).<br>ssessment: German an<br>bonus | pprox. 20 minutes) or         |  |                        |                |
| Allocat  | ion of p  | olaces  |                               |  |                        |                |
|  |   |   |                               |  |                        |                |
| Additio  | onal inf  | ormation  |                               |  |                        |                |
| Focuse<br>AT,ES  | s availa  | able for students of the  | Master's programme I          | nformatik (Computer  | Science, 120 ECTS o    | credits):      |
| Worklo   | ad  |   |                               |  |                        |                |
| 150 h  |   |   |                               |  |                        |                |
|  | ng cycl   | 9   |                               |  |                        |                |
|  | is cycl   | -   | _                             |  |                        |                |
| Deferre  |   | IDOL (avamination to  | ulations for too shing        |  |                        |                |
| Reierre  |   | LPOI (examination reg   |                               | degree programmes)   |                        |                |
| <br>Module   | e appea   | rc in   |                               |  |                        |                |
|  |   | ee (1 major) Computer S   | cionco (2016)                 |  |                        |                |
|  | -   |   |                               |  |                        |                |
| Master's degree (1 major) Mathematics (2016)<br>Master's degree (1 major) Computational Mathematics (2016)   |   |   |                               |  |                        |                |
| Master's degree (1 major) Computational Mathematics (2016)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |   |   |                               |  |                        |                |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)   |   |   |                               |  |                        |                |
| Master's degree (1 major) Computer Science (2017)  |   |   |                               |  |                        |                |
| Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)   |   |   |                               |  |                        |                |
|  | Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019) |   |                               |  |                        |                |
|  | Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019)      |   |                               |  |                        |                |
|  | -   | ning degree Gymnasium   | ÷                             | ion PLUS, Elite Netwo  | ork Bavaria (ENB) (20  | 020)           |
| Master's w   | ith 1 majoı   | Computer Science (2018)   |                               | urg • generated 19-Apr-2025 •<br>ord Master (120 ECTS) Informa |                        | page 105 / 140 |

## Julius-Maximilians-UNIVERSITÄT WÜRZBURG

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

| Module title                                      |   |  |   |  | Abbreviation   |  |
|---|---|--|---|--|--|--|
| Computer Networks and Communication Systems       |   |  |   |  |  |  |
| Module coordinator                                |   |  | Module offered by   |  |  |  |
| holder  | lder of the Chair of Computer Science III     |  |   | Institute of Comput  | er Science   |  |
| ECTS  |   | od of grading  | Only after succ. con  | npl. of module(s)  |  |  |
| 8   | nume  | rical grade  |   |  |  |  |
| Duratio   | on  | Module level   | Other prerequisites   | i  |  |  |
| 1 seme  | ster  | graduate   |   |  |  |  |
| Conten  | ts  |  |   |  |  |  |
| of com<br>and str<br>chies, o<br>and ISO          | puter no<br>ructure o<br>dataflov<br>O archit | omputer and commun<br>etworks and communic<br>of computer networks:<br>v control and traffic co<br>ecture models. Interne<br>unication networks: fur             | ation systems: proble<br>network structure, net<br>ntrol, transfer network.<br>t: structure and basic r | m statement and intr<br>work access, access<br>Communication pro<br>nechanism, TCP/IP, r | oduction to method<br>methods, digital tra<br>tocols: fundamental<br>routing, network ma | architecture<br>nsfer hierar-<br>principles<br>nagement. |
| Intend  | ed learr                                      | ning outcomes  |   |  |  |  |
|   |   | oossess an intricate kn<br>damental principles to  |   | re of computer netwo   | orks and communica   | ition systems  |
| Course  | <b>s</b> (type,                               | , number of weekly con   | tact hours, language –  | - if other than Germa  | n)   |  |
| V (4) +   | Ü (2)   |  |   |  |  |  |
| ster, in  | formati                                       | essment (type, scope,<br>on on whether module  | can be chosen to earn   |  | tion offered — if not  | every seme-  |
| lf anno<br>examir<br>prox. 19<br>Separa<br>Langua | unced I<br>nation o<br>5 minut<br>ite writt   | nation (approx. 60 to 12<br>by the lecturer at the be<br>f one candidate each (<br>es per candidate).<br>en examination for Mas<br>ssessment: German an<br>bonus | eginning of the course,<br>approx. 20 minutes) or<br>ster's students.                                   |  |  |  |
| Allocat   | ion of p                                      | olaces   |   |  |  |  |
|   |   |  |   |  |  |  |
| Additio   | onal info                                     | ormation   |   |  |  |  |
| Focuse<br>ES, LR.                                 |   | able for students of the   | Master's programme I  | nformatik (Computer  | Science, 120 ECTS  | credits): IT,  |
| Worklo  | ad  |  |   |  |  |  |
| 240 h   |   |  |   |  |  |  |
| Teachi  | ng cycl                                       | 9  |   |  |  |  |
|   |   |  |   |  |  |  |
| Referre   | ed to in                                      | LPO I (examination reg   | gulations for teaching-   | degree programmes)   |  |  |
|   |   |  | <u> </u>  | <u> </u>   |  |  |
| Module  | e appea                                       | rs in  |   |  |  |  |
| Master<br>Master<br>Master<br>Supple              | 's degre<br>'s degre<br>'s teach<br>mentar    | ee (1 major) Computer 9<br>ee (1 major) Computer 9<br>ee (1 major) Computer 9<br>ning degree Gymnasiun<br>y course MINT Teacher<br>ning degree Gymnasiun         | Science (2017)<br>Science (2018)<br>n MINT Teacher Educat<br>Education PLUS, Elite                      | Network Bavaria (EN  | B) (2020)  |  |
| Master's w  | ith 1 major                                   | Computer Science (2018)  |   | urg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa                            |  | page 107 / 140   |
|   |   |  | ieg. uata letu  | ia musici (120 ECT3) illiofilla  |  |  |



Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's with 1 major Computer Science (2018)

|   |                                    |                           |                        |                     | Abbreviation                    |  |
|---|------------------------------------|---------------------------|------------------------|---------------------|---------------------------------|--|
| Roboti  | <b>Robotics 1</b> 10-I=RO1-182-mo1 |                           |                        |                     |                                 |  |
| Module coordinator  |                                    |                           |                        | Module offered by   |                                 |  |
| holder  | ofthe                              | Chair of Computer Scienc  | e XVII                 | Institute of Comput | er Science                      |  |
| ECTS  | Methe                              | od of grading             | Only after succ. con   | npl. of module(s)   |                                 |  |
| 8   | nume                               | rical grade               |                        |                     |                                 |  |
| Duratio   | on                                 | Module level              | Other prerequisites    |                     |                                 |  |
| 1 seme  | ster                               | graduate                  |                        |                     |                                 |  |
| Conten  | nts                                |                           |                        |                     |                                 |  |
| ContentsHistory, applications and properties of robots, direct kinematics of manipulators: coordinate systems, rotations,<br>homogenous coordinates, axis coordinates, arm equation. Inverse kinematics: solution properties, end effec-<br>tor configuration, numerical and analytical approaches, examples of different robots for analytical approaches.<br>Workspace analysis and trajectory planning, dynamics of manipulators: Lagrange-Euler model, direct and inver-<br>se dynamics. Mobile robots: direct and inverse kinematics, propulsion system, tricycle, Ackermann steering, ho-<br>lonomes and non-holonome restrictions, kinematic classification of mobile robots, posture kinematic model.<br>Movement control and path planning: roadmap methods, cell decomposition methods, potential field methods.<br>Sensors: position sensors, speed sensors, distance sensors.Intended learning outcomesThe students master the fundamentals of robot manipulators and vehicles and are, in particular, familiar with<br>their kinematics and dynamics as well as the planning of paths and task execution.Courses (type, number of weekly contact hours, language — if other than German)V (4) + Ü (2)<br>Module taught in: EnglishMethod of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)written examination (approx. 60 to 90 minutes) |                                    |                           |                        |                     |                                 |  |
| Langua<br>credita   | age of a<br>ble for                |                           |                        |                     |                                 |  |
| Allocat   | tion of <sub>l</sub>               | places                    |                        |                     |                                 |  |
|   |                                    |                           |                        |                     |                                 |  |
| Additio   | onal inf                           | ormation                  |                        |                     |                                 |  |
|   | s avail<br>HCI, G                  |                           | aster's programme l    | nformatik (Computer | Science, 120 ECTS credits): IS, |  |
| Worklo  | oad                                |                           |                        |                     |                                 |  |
| 240 h   |                                    |                           |                        |                     |                                 |  |
| Teachi  | ng cycl                            | e                         |                        |                     |                                 |  |
|   |                                    |                           |                        |                     |                                 |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |                                    |                           |                        |                     |                                 |  |
|   |                                    |                           |                        |                     |                                 |  |
| Module appears in   |                                    |                           |                        |                     |                                 |  |
| Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Information Systems (2019)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)   |                                    |                           |                        |                     |                                 |  |
| Supple  | ementa                             | ry course MINT Teacher Eo | aucation PLUS, Elite I | Network Bavaria (EN | В) (2020)                       |  |
|   |                                    |                           |                        |                     |                                 |  |

| Module title   |   |   |  |  | Abbreviation                                   |                              |
|--|---|---|--|--|--|------------------------------|
| Roboti   | <b>Robotics 2</b> 10-I=RO2-152-m01  |   |  |  |  |                              |
| Module coordinator Module offered by   |   |   |  |  |  |                              |
|  |   |   | maa XV/II  | -  |  |                              |
|  | 1   | Chair of Computer Scie                              |  | Institute of Comput  | er Science                                     |                              |
| <b>ECTS</b><br>8   |   | od of grading<br>rical grade                        | Only after succ. cor   | npl. of module(s)  |  |                              |
|  | · · · · · ·   |   |  |  |  |                              |
| Duration 1 seme  |   | Module level<br>graduate                            | Other prerequisites  |  |  |                              |
| Conter   |   | graduate  |  |  |  |                              |
| feedba<br>stems:   | ack and<br>founda   | feed-forward, state ob<br>ations of stochastics, ra | ntrollability and observer, feedback with s<br>andom processes, stoc<br>olems of Kalman filters            | tate observer, time o<br>hastic dynamic syste                  | discrete systems, sto<br>ems, Kalman filter: d | ochastic sy-                 |
| Intend   | ed learı  | ning outcomes                                       |  |  |  |                              |
| tions o<br>se the  | of roboti<br>connec   | cs. The students posse<br>tions between the dua     | ls that are necessary to<br>ess a knowledge of adv<br>l pairs controllability - (<br>ionship between the K | anced controller and<br>observability as well                  | l observer methods a<br>as controller design   | and recogni-<br>and observer |
| Course   | <b>es</b> (type   | , number of weekly cor                              | itact hours, language –  | - if other than Germa  | n)   |                              |
| V (4) +  | Ü (2)   |   |  |  |  |                              |
| ster, in<br>writter  | ıformati  | on on whether module<br>nation (approx. 60 to 9     | language — if other th<br>can be chosen to earn<br>o minutes)  |  | ition offered — if not                         | every seme-                  |
|  | tion of p   |   |  |  |  |                              |
| Alloca   |   | λατεσ   |  |  |  |                              |
|  |   |   |  |  |  |                              |
|  |   | ormation<br>able for students of the                | Master's programme I   | nformatik (Compute   | r Science, 120 ECTS (                          | credits): IT,                |
| Worklo   |   |   |  |  |  |                              |
| 240 h  |   |   |  |  |  |                              |
|  | ng cycl   | 6   |  |  |  |                              |
|  |   | -   |  |  |  |                              |
| Referre  | ed to in  | LPO I (examination re                               | gulations for teaching-  | degree programmes)   |  |                              |
|  | Nr. 3 b)  | •   | <u> </u>   | <u> </u>   |  |                              |
|  | e appea   | ars in  |  |  |  |                              |
|  |   |   | ence and Technology (2   | 015)   |  |                              |
|  | -   |   |  | -  | 2015)  |                              |
| First state examination for the teaching degree Gymnasium Computer Science (2015)<br>Master's degree (1 major) Computer Science (2016) |   |   |  |  |  |                              |
| Master's degree (1 major) Mathematics (2016)   |   |   |  |  |  |                              |
| Master's degree (1 major) Computational Mathematics (2016)   |   |   |  |  |  |                              |
|  | Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)              |   |  |  |  |                              |
|  |   |   | Education PLUS, Elite  | Network Bavaria (EN  | B) (2016)                                      |                              |
| Master's degree (1 major) Computer Science (2017)  |   |   |  |  |  |                              |
|  | Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computational Mathematics (2019) |   |  |  |  |                              |
|  | -   | ee (1 major) Computati<br>ee (1 major) Mathemat     |  | 9)   |  |                              |
|  |   |   | -  |  |  |                              |
| Master's w   | ith 1 major   | r Computer Science (2018)                           |  | urg • generated 19-Apr-2025 (<br>Ind Master (120 ECTS) Informa |  | page 110 / 140               |



Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)

| Space Systems Design       10-I=RSE-182-mo1         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)         10       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Contents           In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes          The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t design in the area of spacecraft systems. Also project management for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)         project report (10 to 15 pages) and presentation of project (15 to 30 minutes)       Language of assessment: German and/or English         <  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|
| holder of the Chair of Computer Science VIII       Institute of Computer Science         ECTS       Method of grading       Only after succ. compl. of module(s)         10       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Contents           In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes          The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)       R (6)         Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)         project report (so to 15 pages) and presentation of project (15 to 30 minutes)         L  |  |  |  |  |  |  |
| holder of the Chair of Computer Science VIII       Institute of Computer Science         ECTS       Method of grading       Only after succ. compl. of module(s)         10       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Contents           In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes          The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)       R (6)         Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)         project report (10 to 15 pages) and presentation of project (15 to 30 minutes)  |  |  |  |  |  |  |
| ECTS       Method of grading       Only after succ. compl. of module(s)         10       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Contents         In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes          The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With thelp of the acquired knowledge of methods they are able to create dedicated tools and methods to support the design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)       R         R (6)       Method of assessment (type, scope, language — if other than German, examination offered — if not every senster, information on whether module can be chosen to earn a bonus)         project report (10 to 15 pages) and presentation of project (15 to 30 minutes)       Language of assessment: German and/or English         Assessment offered: In the semester in which the course is offered (The  |  |  |  |  |  |  |
| 10       numerical grade          Duration       Module level       Other prerequisites         1 semester       graduate          Contents       In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, off from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes       Intended learning outcomes         The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)       R (6)         Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)         project report (10 to 15 pages) and presentation of project (15 to 30 minutes)         Language of assessment: German and/or English         Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered |  |  |  |  |  |  |
| 1 semester       graduate          Contents       In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes       Intended learning outcomes         The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With thelp of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)       R (6)         Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)       project report (10 to 15 pages) and presentation of project (15 to 30 minutes)         Language of assessment: German and/or English       Assessment conter for English         Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered the respective semester.)              |  |  |  |  |  |  |
| Contents         In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)".         Intended learning outcomes         The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With the help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained.         Courses (type, number of weekly contact hours, language — if other than German)         R (6)         Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus)         project report (10 to 15 pages) and presentation of project (15 to 30 minutes)         Language of assessment: German and/or English         Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered the respective semester.)   |  |  |  |  |  |  |
| In the course of a semesterproject, a spacecraft system will be designed in a team. The selection of the space craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi lunar phenomenons (TLP)". Intended learning outcomes The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained. Courses (type, number of weekly contact hours, language — if other than German) R (6) Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus) project report (10 to 15 pages) and presentation of project (15 to 30 minutes) Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered the respective semester.)  |  |  |  |  |  |  |
| craftsystem is done anew each semester and draws inspiration from current trends and concrete research, oft<br>from the area of microsatellites, like "design of a nanosatellitemission for detection and observation of transi<br>lunar phenomenons (TLP)".<br>Intended learning outcomes<br>The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t<br>elementary design aspects, create requirements accordingly and consider them in their system design. With t<br>help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th<br>design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems<br>will be trained.<br>Courses (type, number of weekly contact hours, language — if other than German)<br>R (6)<br>Method of assessment (type, scope, language — if other than German, examination offered — if not every sen<br>ster, information on whether module can be chosen to earn a bonus)<br>project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)  |  |  |  |  |  |  |
| The students gain fundamental knowledge about the design of spacecraft systems. They are able to analyse t elementary design aspects, create requirements accordingly and consider them in their system design. With t help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems will be trained. Courses (type, number of weekly contact hours, language — if other than German) R (6) Method of assessment (type, scope, language — if other than German, examination offered — if not every sen ster, information on whether module can be chosen to earn a bonus) project report (10 to 15 pages) and presentation of project (15 to 30 minutes) Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered the respective semester.)   |  |  |  |  |  |  |
| elementary design aspects, create requirements accordingly and consider them in their system design. With t<br>help of the acquired knowledge of methods they are able to create dedicated tools and methods to support th<br>design in the area of spacecraft systems. Also projectmanagement for the development of spacecraft systems<br>will be trained.<br><b>Courses</b> (type, number of weekly contact hours, language — if other than German)<br>R (6)<br><b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every sen<br>ster, information on whether module can be chosen to earn a bonus)<br>project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there will<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)  |  |  |  |  |  |  |
| R (6)<br>Method of assessment (type, scope, language — if other than German, examination offered — if not every sen<br>ster, information on whether module can be chosen to earn a bonus)<br>project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there wil<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)  |  |  |  |  |  |  |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every sen<br>ster, information on whether module can be chosen to earn a bonus)<br>project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there wil<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)   |  |  |  |  |  |  |
| ster, information on whether module can be chosen to earn a bonus)<br>project report (10 to 15 pages) and presentation of project (15 to 30 minutes)<br>Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there wil<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)   |  |  |  |  |  |  |
| Language of assessment: German and/or English<br>Assessment offered: In the semester in which the course is offered (The project will not be repeated; there wil<br>not be another project with the same topic. Assessment can, therefore, only be offered for the project offered<br>the respective semester.)   |  |  |  |  |  |  |
| Allocation of places  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |
|   |  |  |  |  |  |  |
| Additional information  |  |  |  |  |  |  |
| Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): L<br>Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).   |  |  |  |  |  |  |
| Workload  |  |  |  |  |  |  |
| 300 h   |  |  |  |  |  |  |
| Teaching cycle  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |
| Module appears in   |  |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2018)   |  |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2021)   |  |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2023)   |  |  |  |  |  |  |
| Master's degree (1 major) Computer Science (2025)   |  |  |  |  |  |  |

| Module title  |  |  |   |   | Abbreviation                                   |                          |
|---|--|--|---|---|--|--------------------------|
| Software Architecture 10-I=SAR-161-m01  |  |  |   |   |  |                          |
| Module coordinator  |  |  | Module offered by                             |   |  |                          |
| holder of the Chair of Computer Science II Institute of Computer Science                          |  |  | er Science                                    |   |  |                          |
| ECTS  |  | od of grading  | Only after succ. con                          | npl. of module(s)   |  |                          |
| 5   |  | rical grade  |   |   |  |                          |
| Duratio   | on   | Module level   | Other prerequisites                           |   |  |                          |
| 1 seme  |  | graduate   |   |   |  |                          |
| Conten  | its  |  |   |   |  |                          |
| tural st<br>sed so<br>cloud-r   | yles, so<br>ftware e<br>native a   | o software architecture, a<br>oftware components, inte<br>engineering, service-orie<br>nd serverless computing<br>architecture | erface models and de<br>nted architectures, m | sign guidelines, des<br>icroservice architect                 | ign-by-contract, com<br>ures, scalability of d | iponent-ba-<br>atabases, |
| Intend  | ed learı   | ning outcomes  |   |   |  |                          |
| The stu   | idents j   | oossess a fundamental a<br>n modern software archi   |   |   |  |                          |
| Course  | <b>s</b> (type   | , number of weekly conta   | act hours, language –                         | - if other than Germa   | n)   |                          |
| V (2) +   | Ü (2)  |  |   |   |  |                          |
| Metho   | d of ass   | e <b>essment</b> (type, scope, la<br>on on whether module c  |   |   | tion offered — if not                          | every seme-              |
| examir<br>prox. 1<br>Langua   | nation o<br>5 minut  | by the lecturer at the beg<br>f one candidate each (aj<br>es per candidate).<br>ssessment: German and<br>bonus                 | pprox. 20 minutes) or                         |   |  |                          |
| Allocat   | ion of p   | olaces   |   |   |  |                          |
|   |  |  |   |   |  |                          |
| Additio   | onal inf   | ormation   |   |   |  |                          |
| Focuse<br>SE,IT,E   |  | able for students of the N   | Aaster's programme I                          | nformatik (Computer   | Science, 120 ECTS o                            | credits):                |
| Worklo  | ad   |  |   |   |  |                          |
| 150 h   |  |  |   |   |  |                          |
| -   | ng cycl  | e  |   |   |  |                          |
|   |  |  |   |   |  |                          |
| Referre   | ed to in   | LPOI (examination regu   | lations for teaching-                         | degree programmes)  |  |                          |
|   | Nr. 3 b)   |  |   |   |  |                          |
| Module appears in   |  |  |   |   |  |                          |
| Module appears in<br>Master's degree (1 major) Computer Science (2016)                            |  |  |   |   |  |                          |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016) |  |  |   |   |  |                          |
|   | -  | ee (1 major) Computation   |   | 6)  |  |                          |
|   | Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |  |   |   |  | 016)                     |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)              |  |  |   |   |  |                          |
| Master  | Master's degree (1 major) Computer Science (2017)  |  |   |   |  |                          |
| Master  | 's degr  | ee (1 major) Computer So   | cience (2018)                                 |   |  |                          |
|   |  | es (Master) Computer Sci   |   |   |  |                          |
| Master's w  | ith 1 major  | Computer Science (2018)  |   | ırg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa |  | page 113 / 140           |

UNIVERSITÄT WÜRZBURG Master's degree (1 major) Computational Mathematics (2019) Master's degree (1 major) Mathematics (2019) Master's degree (1 major) Information Systems (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computer Science (2021)

Master's degree (1 major) Computational Mathematics (2022)

Master's degree (1 major) Information Systems (2022)

Master's degree (1 major) Mathematics (2022)

Master's degree (1 major) Computer Science (2023)

Master's degree (1 major) Computational Mathematics (2024)

Master's degree (1 major) Management (2024)

Master's degree (1 major) Mathematics (2024)

Master's degree (1 major) Information Systems (2024)

Master's degree (1 major) Economathematics (2024)

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Information Systems (2025)

Master's degree (1 major) Management (2025)

Master's degree (1 major) Computer Science (2025)

Master's degree (1 major) Economathematics (2025)

| Modul   |                |   |                        |                       | Abbreviation                     |
|---|----------------|---|------------------------|-----------------------|----------------------------------|
| Seminar 1 - Current Topics in Computer Science  |                |   |                        |                       | 10-I=SEM3-161-m01                |
| Modul   | e coord        | inator  |                        | Module offered by     | <u> </u>                         |
|   |                | es Informatik (Computer                             | Science)               | Institute of Comput   | ter Science                      |
| ECTS  | 1              | od of grading                                       | Only after succ. com   |                       |                                  |
| 5   |                | rical grade   |                        |                       |                                  |
| )<br>Duratio  |                | Module level  | Other prorequisites    |                       |                                  |
| 1 seme  |                | graduate  | Other prerequisites    |                       |                                  |
|   |                | glauuale  |                        |                       |                                  |
| Conter  | -              |   |                        |                       |                                  |
|   |                | eview of a current topic i<br>nd oral presentation. | n computer science b   | based on literature a | nd, where applicable, software   |
| Intend  | ed lear        | ning outcomes                                       |                        |                       |                                  |
| The stu   | udents a       | are able to independently                           | review a current top   | ic in computer scier  | ice, to summarise the main       |
| aspect  | s in wri       | tten form and to orally pr                          | esent these in an app  | propriate way.        |                                  |
| Course  | <b>s</b> (type | , number of weekly conta                            | ict hours, language –  | · if other than Germa | an)                              |
| S (2)   |                |   |                        |                       |                                  |
| Metho   | d of ass       | essment (type, scope, la                            | nguage — if other tha  | an German, examina    | ation offered — if not every sem |
|   |                | on on whether module ca                             |                        |                       |                                  |
| term pa   | aper (10       | to 15 pages) and preser                             | tation (30 to 45 minu  | ites) with subseque   | nt discussion on a topic from th |
|   |                | iter science  |                        |                       |                                  |
| Langua  | age of a       | ssessment: German and                               | /or English            |                       |                                  |
| Allocat   | tion of p      | olaces  |                        |                       |                                  |
|   |                |   |                        |                       |                                  |
| Additio   | onal inf       | ormation  |                        |                       |                                  |
|   |                | able for students of the M<br>_R, HCI´, GE.         | laster's programme li  | nformatik (Compute    | r Science, 120 ECTS credits): AT |
| Worklo  |                | · ·   |                        |                       |                                  |
| 150 h   |                |   |                        |                       |                                  |
|   | ng cycl        | e   |                        |                       |                                  |
|   |                | -   |                        |                       |                                  |
| Roforra   | d to in        | LPOI (examination regu                              | lations for teaching   | legree programmes     |                                  |
| Referre   |                |   | lations for teaching-t | icaree programmes)    |                                  |
| <br>Modul   | e appea        | ars in  |                        |                       |                                  |
|   |                |   | ionco (2016)           |                       |                                  |
| Master's degree (1 major) Computer Science (2016)   |                |   |                        |                       |                                  |
| Master's degree (1 major) Mathematics (2016)  |                |   |                        |                       |                                  |
| Master's degree (1 major) Computational Mathematics (2016)<br>Master's degree (1 major) Digital Humanities (2016) |                |   |                        |                       |                                  |
| Master's degree (1 major) Digital Humanities (2016)<br>Master's degree (1 major) Computer Science (2017)          |                |   |                        |                       |                                  |
|   | -              | ee (1 major) Computer Sc                            |                        |                       |                                  |
|   | -              | ee (1 major) Computation                            |                        | a)                    |                                  |
|   | -              | ee (1 major) Mathematics                            |                        | 71                    |                                  |
|   | -              |   | -                      | on PLUS Flite Netw    | ork Bavaria (ENB) (2020)         |
|   |                | y course MINT Teacher E                             |                        |                       |                                  |
| Sabbic  | mentu          | , course militir reacher E                          |                        |                       | -, (2020)                        |

| Module  | e title        |   |                       |                       | Abbreviation                      |
|---|----------------|---|-----------------------|-----------------------|-----------------------------------|
| Seminar 2 - Current Topics in Computer Science  |                |   |                       |                       | 10-I=SEM4-161-m01                 |
| Module  | e coord        | inator  |                       | Module offered by     |                                   |
| Dean o  | f Studi        | es Informatik (Computer S                                   | Science)              | Institute of Comput   | er Science                        |
| ECTS  | Metho          | od of grading   | Only after succ. con  | npl. of module(s)     |                                   |
| 5   | nume           | rical grade   |                       |                       |                                   |
| Duratio   | on             | Module level  | Other prerequisites   |                       |                                   |
| 1 seme  | ster           | graduate  |                       |                       |                                   |
| Conten  | ts             |   |                       |                       |                                   |
|   |                | review of a current topic ind oral presentation.            | n computer science b  | based on literature a | nd, where applicable, software    |
| Intend  | ed lear        | ning outcomes   |                       |                       |                                   |
|   |                | are able to independently<br>tten form and to orally pr     |                       |                       | ce, to summarise the main         |
| Course  | <b>s</b> (type | , number of weekly conta                                    | ct hours, language –  | - if other than Germa | n)                                |
| S (2)   |                |   |                       |                       |                                   |
|   |                | <b>sessment</b> (type, scope, la<br>on on whether module ca |                       |                       | tion offered — if not every seme- |
| semina  | ar             | o to 15 pages) and presen<br>ssessment: German and,         |                       | ites) with subsequer  | nt discussion on the topic of the |
| Allocat   | . –            |   |                       |                       |                                   |
|   | <b>•</b>       |   |                       |                       |                                   |
| Additio   | onal inf       | ormation  |                       |                       |                                   |
|   |                | able for students of the N<br>LR, HCI, GE                   | laster's programme l  | nformatik (Computer   | r Science, 120 ECTS credits): AT, |
| Worklo  | ad             |   |                       |                       |                                   |
| 150 h   |                |   |                       |                       |                                   |
| Teachi  | ng cycl        | е   |                       |                       |                                   |
|   |                |   |                       |                       |                                   |
| Referre   | ed to in       | LPOI (examination regu                                      | lations for teaching- | degree programmes)    |                                   |
|   |                |   |                       |                       |                                   |
| Module appears in   |                |   |                       |                       |                                   |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) |                |   |                       |                       |                                   |
|   |                | y course MINT Teacher Ed                                    |                       |                       |                                   |

| Module title  |  |   |  |  |  |  |
|---|--|---|--|--|--|--|
| Spacecraft System Design 10-I=SSD-152-m01   |  |   |  |  |  |  |
| Module coordinator  |  |   |  |  |  |  |
| cience VII  |  | Institute of Compute  | er Science   |  |  |  |
| Onl   | y after succ. com  | pl. of module(s)  |  |  |  |  |
|   |  |   |  |  |  |  |
| Oth   | er prerequisites   |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
| Introduction: history of space flight, system design of spacecraft. Space dynamics: two-body dynamics, Kepler orbits, disturbance forces, transfer orbits. Mission analysis: earth and sun-synchronous orbits, shadows, solar angle of incidence. Thermal control of satellites: thermal analysis, thermal design and technologies, verification of thermal designs. Telecommunication: ground contact analysis, data transmission, satellite monitoring (telemetry, telecommando). Structure and mechanisms. Energy systems: primary, secondary, management, power generation: solar cells. On-board data processing. Propulsion systems. Tests (mechanical, electrical). Operation of spacecraft. Ground segment. |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   | , .  | ,   | g the example of spacecraft, ma-   |  |  |  |
| contact ho  | ours, language —   | if other than Germa   | n)   |  |  |  |
|   |  |   |  |  |  |  |
| ule can be  | e chosen to earn   |   | tion offered — if not every seme-  |  |  |  |
|   | ·  |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
| the Maste   | er's programme Ir  | nformatik (Computer   | Science, 120 ECTS credits): ES,  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
|   |  |   |  |  |  |  |
| n regulatio   | ons for teaching-c   | legree programmes)  |  |  |  |  |
| § 22    Nr. 3 b)  |  |   |  |  |  |  |
| Module appears in   |  |   |  |  |  |  |
| Master's degree (1 major) Space Science and Technology (2015)<br>First state examination for the teaching degree Gymnasium Computer Science (2015)<br>Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)<br>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)<br>Master's degree (1 major) Computer Science (2021)  |  |   |  |  |  |  |
|   | Onl            Oth            ht, system         er orbits. Nol of satel         unication:         re and me         data procession         ects of the         ion into a         contact he         pe, langu:         ule can be         o 120 min         the Master         aregulatic         Science ar         ching deg         ter Scienc         ster Science         sium MINT         her Educa | Only after succ. com              Other prerequisites      th, system design of space er orbits. Mission analysis: ol of satellites: thermal an unication: ground contact re and mechanisms. Energy data processing. Propulsion ects of the layouting of techtion into a working whole and contact hours, language — pe, language — if other that lule can be chosen to earn to 120 minutes) the Master's programme In Science and Technology (2 acting degree Gymnasium ter Science (2017) ter Science (2017) ter Science (2018) sium MINT Teacher Educati her Education PLUS, Elite I | Only after succ. compl. of module(s)              Other prerequisites      th, system design of spacecraft. Space dynamiler orbits. Mission analysis: earth and sun-synchol of satellites: thermal analysis, thermal design unication: ground contact analysis, data transformer and mechanisms. Energy systems: primary, stata processing. Propulsion systems. Tests (methods) tests of the layouting of technical systems. Using ion into a working whole are being analysed. contact hours, language — if other than German examina lule can be chosen to earn a bonus) to 120 minutes) the Master's programme Informatik (Computer formatic the master's programme Informatik (Computer formatic the master's programme Informatik (Computer formatic the geree Gymnasium Computer Science (2016) ter Science (2017) ter Science (2017) ter Science (2018) sium MINT Teacher Education PLUS, Elite Network Bavaria (ENI) |  |  |  |

| Module title   |   |                           |                        |                     | Abbreviation                      |  |
|--|---|---------------------------|------------------------|---------------------|-----------------------------------|--|
| Securit  | Security of Software Systems 10-I=SSS-172-m01 |                           |                        |                     |                                   |  |
| Module coordinator   |   |                           |                        | Module offered by   |                                   |  |
| holder   | of the C                                      | Chair of Computer Science | e II                   | Institute of Comput | er Science                        |  |
| ECTS   | Metho   | od of grading             | Only after succ. con   | npl. of module(s)   |                                   |  |
| 5  | nume  | rical grade               |                        |                     |                                   |  |
| Duratio  | on  | Module level              | Other prerequisites    |                     |                                   |  |
| 1 seme   | ster  | graduate                  |                        |                     |                                   |  |
| Conten   | ts  |                           |                        |                     |                                   |  |
| The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on mo-<br>dern computer systems, as well as the measures implemented to protect against these attacks. In the course,<br>the following topics are discussed: <ul> <li>x86-64 instruction set architecture and assembly language</li> <li>Runtime attacks (code injection, code reuse, defenses)</li> <li>Web security</li> <li>Blockchains and smart contracts</li> <li>Side-channel attacks</li> <li>Hardware security</li> </ul> <li>Intended learning outcomes</li> <li>Students gain a deep understanding of software security, from hardware and low-level attacks to modern concepts such as blockchains. The lecture prepares for research in the area of security and privacy, while the exercises allow students to gain hands-on experience with attacks and analysis of systems from an attacker's perspective.</li> <li>Courses (type, number of weekly contact hours, language — if other than German)</li> <li>V (2) + Ü (2)</li> <li>Module taught in: English</li> |   |                           |                        |                     |                                   |  |
|  |   |                           |                        |                     | tion offered — if not every seme- |  |
| ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: English<br>creditable for bonus   |   |                           |                        |                     |                                   |  |
| Allocat  | ion of p                                      | olaces                    |                        |                     |                                   |  |
|  |   |                           |                        |                     |                                   |  |
| Additio  | onal info                                     | ormation                  |                        |                     |                                   |  |
| IS, LR,  | HCI, ES                                       |                           |                        | nformatik (Computer | Science, 120 ECTS credits): SE,   |  |
| Workload   |   |                           |                        |                     |                                   |  |
| 150 h  |   |                           |                        |                     |                                   |  |
| Teachi   | ng cycl                                       | 9                         |                        |                     |                                   |  |
|  |   |                           |                        |                     |                                   |  |
| Referre  | ed to in                                      | LPOI (examination regu    | lations for teaching-o | degree programmes)  |                                   |  |
|  |   |                           |                        |                     |                                   |  |
| Module   | e appea                                       | irs in                    |                        |                     |                                   |  |
| Master   | 's degre                                      | ee (1 major) Computer Sc  | ience (2017)           |                     |                                   |  |

Master's with 1 major Computer Science (2018)

Master's degree (1 major) Computer Science (2018) Master's degree (1 major) Computational Mathematics (2019) Master's degree (1 major) Mathematics (2019) Master's degree (1 major) Information Systems (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAI) (2020)

| Module title Abbreviation  |  |  |  |  |   |                               |
|--|--|--|--|--|---|-------------------------------|
| Discret  | Discrete Event Simulation 10-I=ST-161-m01  |  |  |  |   |                               |
| Module coordinator   |  |  |  | Module offered by  |   |                               |
| holder of the Chair of Computer Science III  |  |  | e III  | Institute of Comput  | er Science                                  |                               |
| ECTS Method of grading Only after succ. compl. of module(s)  |  |  |  |  |   |                               |
| 8  | nume   | rical grade  |  |  |   |                               |
| Duratio  | on   | Module level   | Other prerequisites                            |  |   |                               |
| 1 seme   | ster   | graduate   |  |  |   |                               |
| Conten   | Its  |  |  |  |   |                               |
| bles, ra<br>measu  | andom s<br>red data<br>of mode   | o simulation techniques,<br>sample theory and estim<br>a, planning and evaluation<br>l creation and simulation | ation techniques, sta<br>on of simulation expe | tistical analysis of si<br>riments, special ran                | imulation values, ins<br>dom processes, pos | spection of<br>sibilities and |
| Intend   | ed learr   | ning outcomes  |  |  |   |                               |
| (techni  |  | possess the methodic kn<br>stems, the evaluation of r<br>s.  | <b>e</b> ,                                     |  |   |                               |
| Course   | <b>s</b> (type,  | , number of weekly conta   | ct hours, language –                           | - if other than Germa  | n)  |                               |
| V (4) +  | Ü (2)  |  |  |  |   |                               |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate).<br>Language of assessment: German and/or English<br>creditable for bonus |  |  |  |  |   |                               |
| Allocat  | ion of p   | laces  |  |  |   |                               |
|  |  |  |  |  |   |                               |
| Additio  | onal info  | ormation   |  |  |   |                               |
| Focuse   |  | able for students of the N   | laster's programme l                           | nformatik (Computer  | Science, 120 ECTS o                         | credits):                     |
| Worklo   | ad   |  |  |  |   |                               |
| 240 h  |  |  |  |  |   |                               |
| Teachi   | ng cycl  | 9  |  |  |   |                               |
|  | 0 . 7  | -  |  |  |   |                               |
| Poforra  | d to in  | IPOL (examination regu   | lations for teaching                           | legree programmes)   |   |                               |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)   |  |  |  |  |   |                               |
| Module appears in  |  |  |  |  |   |                               |
| Master's degree (1 major) Computer Science (2016)  |  |  |  |  |   |                               |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016)  |  |  |  |  |   |                               |
| Master   | 's degre   | ee (1 major) Computation   | al Mathematics (201                            | 6)   |   |                               |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)   |  |  |  |  |   |                               |
|  | Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) |  |  |  |   |                               |
|  | -  | ee (1 major) Computer Sc   |  |  |   |                               |
|  | -  | ee (1 major) Computer Sc   |  |  |   |                               |
|  | -  | ee (1 major) Computation   |  | -  |   |                               |
| Master's w   | ith 1 major  | Computer Science (2018)  |  | ırg ● generated 19-Apr-2025 ●<br>rd Master (120 ECTS) Informat |   | page 120 / 140                |

Master's degree (1 major) Mathematics (2019) Master's degree (1 major) Information Systems (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Aerospace Computer Science (2020) Master's degree (1 major) eXtended Artificial Intelligence (xtAl) (2020)

| Module title Abbreviation   |   |  |   |   |   |   |
|---|---|--|---|---|---|---|
| NLP an  | NLP and Text Mining 10-I=STM-162-mo1        |  |   |   |   |   |
| Module coordinator Module offered by  |   |  |   |   |   |   |
| holder of the Chair of Computer Science VI Institute of Computer Science  |   |  |   |   |   |   |
| ECTS  | 1   | d of grading   | Only after succ. con  |   |   |   |
| 5   |   | rical grade  |   |   |   |   |
| Duratio   | ·   | Module level   | Other prerequisites   |   |   |   |
| 1 seme  |   | graduate   |   |   |   |   |
| Conten  |   | 3.44444  | 1   |   |   |   |
| tection<br>stic par<br>The stu<br>text mi   | , tokeni<br>rsing, w<br>Idents p<br>ning an | n the following areas: de<br>sation, collocation, N-g<br>ord sense disambiguati<br>possess theoretical and<br>d language processing r<br>ave gained experience i | ram models, morphole<br>on, term extraction m<br>practical knowledge a<br>nostly for English. The | ogy, hidden Markov<br>ethods, information<br>about typical method<br>ey are able to solve p | models for tagging,  <br>extraction, sentimer<br>Is and algorithms in<br>problems through the | probabili-<br>nt analysis.<br>the area of |
| Intend  | ed learr                                    | ning outcomes  |   |   |   |   |
| The stu<br>text mi  | ıdents µ<br>ning an                         | oossess theoretical and<br>d language processing.<br>ve gained experience in   | They are able to solve  | e practical problems  | with the methods ac   |   |
| Course  | <b>s</b> (type,                             | number of weekly cont  | act hours, language –   | - if other than Germa   | n)  |   |
| V (2) +   | Ü (2)                                       |  |   |   |   |   |
| Method of assessment (type, scope, language — if other than German, examination offered — if not every seme-<br>ster, information on whether module can be chosen to earn a bonus)<br>written examination (approx. 60 to 120 minutes).<br>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral<br>examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (ap-<br>prox. 15 minutes per candidate). |   |  |   |   |   |   |
|   |   | ssessment: German and  | l/or English  |   |   |   |
| Allocat   | ion of p                                    | olaces   | -   |   |   |   |
|   |   |  |   |   |   |   |
| Additio   | onal info                                   | ormation   |   |   |   |   |
| Focuse<br>IT, HCI.  |   | able for students of the I   | Master's programme l  | nformatik (Computer   | Science, 120 ECTS o   | credits): AT,                             |
| Worklo  | ad  |  |   |   |   |   |
| 150 h   |   |  |   |   |   |   |
|   | ng cycl                                     | 9  |   |   |   |   |
| Teaching cycle  |   |  |   |   |   |   |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)  |   |  |   |   |   |   |
| § 22 II Nr. 3 b)  |   |  |   |   |   |   |
| Module appears in   |   |  |   |   |   |   |
| Master's degree (1 major) Computer Science (2016)   |   |  |   |   |   |   |
| Master's degree (1 major) computer Science (2017)<br>Master's degree (1 major) Computer Science (2017)  |   |  |   |   |   |   |
| Master's degree (1 major) Computer Science (2017)<br>Master's degree (1 major) Computer Science (2018)  |   |  |   |   |   |   |
| Master's degree (1 major) Computational Mathematics (2019)  |   |  |   |   |   |   |
| Master's degree (1 major) Mathematics (2019)  |   |  |   |   |   |   |
| Master's degree (1 major) Information Systems (2019)  |   |  |   |   |   |   |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  |   |  |   |   |   |   |
|   |   | y course MINT Teacher E  |   |   |   |   |
| Master's w  | ith 1 major                                 | Computer Science (2018)  |   | ırg • generated 19-Apr-2025 •<br>rd Master (120 ECTS) Informa                               |   | page 122 / 140                            |

Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Information Systems (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's degree (1 major) Information Systems (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Master's degree (1 major) Mathematical Data Science (2025)

| Module title   |  |  |   |  | Abbreviation           |                |
|--|--|--|---|--|------------------------|----------------|
| Visualization of Graphs 10-I=VG-161-m01  |  |  |   |  |                        |                |
| Module coordinator Module offered  |  |  |   | Module offered by  |                        |                |
| holder   | of the (   | Chair of Computer Scie   | nce l   | Institute of Comput  | er Science             |                |
| ECTS   | Metho  | od of grading  | Only after succ. cor  | npl. of module(s)  |                        |                |
| 5  | nume   | rical grade  |   |  |                        |                |
| Duratio  | on   | Module level   | Other prerequisites   | ;  |                        |                |
| 1 seme   | ster   | graduate   |   |  |                        |                |
| Conten   | lts  |  |   |  |                        |                |
| <i>phenth</i><br>the pla   | <i>eorie (/</i><br>nar sep   | Algorithmic Graph Theo   | nt algorithms to draw g<br>ory) such as divide and<br>used. We will become<br>ese measures. | conquer, flow netwo  | orks, integer progran  | nming and      |
| Intend   | ed lear  | ning outcomes  |   |  |                        |                |
|  |  |  | raph visualisation and<br>g and solving of proble   |  |                        |                |
| Course   | <b>s</b> (type   | , number of weekly cor   | ntact hours, language –   | - if other than Germa  | in)                    |                |
| V (2) +  | Ü (2)  |  |   |  |                        |                |
|  |  |  | language — if other th<br>can be chosen to earn   |  | ition offered — if not | every seme-    |
| examir<br>prox. 19<br>Langua   | nation c<br>5 minut  | f one candidate each (<br>es per candidate).<br>ssessment: German ar | eginning of the course,<br>(approx. 20 minutes) of<br>nd/or English                         |  |                        |                |
| Allocat  | ion of p   | olaces   |   |  |                        |                |
|  |  |  |   |  |                        |                |
| Additio  | onal inf   | ormation   |   |  |                        |                |
| Focuse<br>AT,IT,H  |  | able for students of the   | e Master's programme I  | nformatik (Compute   | r Science, 120 ECTS    | credits):      |
| Worklo   | ad   |  |   |  |                        |                |
| 150 h  |  |  |   |  |                        |                |
| -  | ng cycl  | e  |   |  |                        |                |
|  | 0 . )  | -  |   |  |                        |                |
| Referre  | d to in  | <b>IPOI</b> (examination re  | gulations for teaching-   | degree programmes)   |                        |                |
| Referred to in LPO I (examination regulations for teaching-degree programmes)         § 22 II Nr. 2 b) |  |  |   |  |                        |                |
| § 22 Il Nr. 3 b)   |  |  |   |  |                        |                |
| Module appears in Master's degree (1 major) Computer Science (2016)                                    |  |  |   |  |                        |                |
| Master's degree (1 major) Computer Science (2016)<br>Master's degree (1 major) Mathematics (2016)      |  |  |   |  |                        |                |
| Master's degree (1 major) Computational Mathematics (2016)   |  |  |   |  |                        |                |
| Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)     |  |  |   |  |                        |                |
| Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)                   |  |  |   |  |                        |                |
| Master's degree (1 major) Computer Science (2017)  |  |  |   |  |                        |                |
| Master's degree (1 major) Computer Science (2018)  |  |  |   |  |                        |                |
|  | Master's degree (1 major) Computational Mathematics (2019)<br>Master's degree (1 major) Mathematics (2019) |  |   |  |                        |                |
| Imaster  | Jucgi  | ce (I major) mathemat  | (2019)  |  |                        |                |
| Master's w   | ith 1 majo   | r Computer Science (2018)  |   | urg • generated 19-Apr-2025 •<br>ord Master (120 ECTS) Informa |                        | page 124 / 140 |

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Master's degree (1 major) Computer Science (2021) Master's degree (1 major) Computational Mathematics (2022) Master's degree (1 major) Mathematics (2022) Master's degree (1 major) Computer Science (2023) Master's degree (1 major) Computational Mathematics (2024) Master's degree (1 major) Mathematics (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Master's degree (1 major) Computer Science (2025)

Master's degree (1 major) Mathematical Data Science (2025)

| Module title                 |  |   |   |                     | Abbreviation  |  |
|------------------------------|--|---|---|---------------------|---|--|
| Knowledge-based Systems      |  |   |   |                     | 10-l=WBS-161-m01  |  |
| Module                       | e coord  | inator  |   | Module offered by   |   |  |
| holder                       | of the (   | Chair of Computer Scienc  | e VI                                    | Institute of Comput | er Science  |  |
| ECTS                         |  | od of grading   | Only after succ. com                    | pl. of module(s)    |   |  |
| 5                            | nume   | rical grade   |   |                     |   |  |
| Duratio                      |  | Module level  | Other prerequisites                     |                     |   |  |
| 1 seme                       | ster   | graduate  |   |                     |   |  |
| Conten                       | ts   |   |   |                     |   |  |
|                              |  | n the following areas: kno<br>dge acquisition, learning   |   |                     | ge representation, solving me-                                    |  |
| Intende                      | ed learı   | ning outcomes   |   |                     |   |  |
|                              |  | oossess theoretical and p<br>ding knowledge formalisa   |   |                     | g and design of knowledge-based<br>small project.                 |  |
| Course                       | <b>s</b> (type   | , number of weekly conta  | ct hours, language —                    | if other than Germa | n)  |  |
| V (2) +                      | Ü (2)  |   |   |                     |   |  |
|                              |  | essment (type, scope, la<br>on on whether module ca   |   |                     | tion offered — if not every seme-                                 |  |
| examin<br>prox. 19<br>Separa | ation o<br>5 minut<br>te writt<br>1ge of a   | f one candidate each (ap<br>res per candidate).<br>en examination for Maste<br>ssessment: German and, | pprox. 20 minutes) or<br>er's students. |                     | tion may be replaced by an oral<br>in groups of 2 candidates (ap- |  |
| Allocat                      | ion of p   | olaces  |   |                     |   |  |
|                              |  |   |   |                     |   |  |
| Additio                      | onal info  | ormation  |   |                     |   |  |
| Focuse<br>IT, IS, F          |  |   | laster's programme li                   | nformatik (Computer | Science, 120 ECTS credits): SE,                                   |  |
| Worklo                       | ad   |   |   |                     |   |  |
| 150 h                        |  |   |   |                     |   |  |
| Teaching cycle               |  |   |   |                     |   |  |
|                              |  |   |   |                     |   |  |
| Referre                      | <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes) |   |   |                     |   |  |
|                              |  |   |   |                     |   |  |
| Module appears in            |  |   |   |                     |   |  |
|                              | Master's degree (1 major) Computer Science (2016)                                    |   |   |                     |   |  |
|                              | -  | ee (1 major) Computer Sc  |   |                     |   |  |
| Master                       | Master's degree (1 major) Computer Science (2018)                                    |   |   |                     |   |  |

| Module title |          |   |  |                       | Abbreviation  |  |
|--------------|----------|---|--|-----------------------|---|--|
| Master       | r's Thes | sis Computer Science                        |  |                       | 10-I-MA-161-m01   |  |
| Modul        | e coord  | inator                                      |  | Module offered by     | <u> </u>  |  |
| Dean o       | of Studi | es Informatik (Compu                        | ter Science)   | Institute of Compu    | ter Science   |  |
| ECTS         | Meth     | od of grading                               | Only after succ. cor                                 | npl. of module(s)     |   |  |
| 25           | nume     | rical grade                                 |  |                       |   |  |
| Duratio      | on       | Module level                                | Other prerequisites                                  | 5                     |   |  |
| 1 seme       | ester    | graduate                                    |  |                       |   |  |
| Conter       | nts      |   |  |                       |   |  |
| Indepe       | endent   | research and work on                        | a topic of computer scie                             | ence that was agreed  | l upon with a lecturer.   |  |
| Intend       | ed lear  | ning outcomes                               |  |                       |   |  |
|              | ds that  |   |  |                       | nce and use the knowledge and<br>result of their work in an accepta |  |
| Course       | es (type | , number of weekly co                       | ntact hours, language –                              | – if other than Germa | an)   |  |
| No cou       | irses as | signed to module                            |  |                       |   |  |
|              |          |   | e, language — if other th<br>e can be chosen to earn |                       | ation offered — if not every seme-                                  |  |
|              |          | is (50 to 100 pages)<br>ssessment: German a | nd/or English  |                       |   |  |
| Allocat      | tion of  | places                                      |  |                       |   |  |
|              |          |   |  |                       |   |  |
| Additio      | onal inf | ormation                                    |  |                       |   |  |
| Time to      | o comp   | lete: 6 months                              |  |                       |   |  |
| Worklo       | ad       |   |  |                       |   |  |
| 750 h        |          |   |  |                       |   |  |
| Teachi       | ng cycl  | e   |  |                       |   |  |
|              | - /      |   |  |                       |   |  |
| Referre      | ed to in | LPOI (examination r                         | egulations for teaching-                             | degree programmes     | )   |  |
|              |          |   |  |                       |   |  |
| Modul        | e appea  | ars in                                      |  |                       |   |  |
|              |          | ee (1 major) Computer                       | Science (2016)                                       |                       |   |  |
|              | -        | ee (1 major) Computer                       |  |                       |   |  |
|              | -        | ee (1 major) Computer                       |  |                       |   |  |
|              | -        | ee (1 major) Computer                       |  |                       |   |  |
|              | -        | ee (1 major) Computer                       |  |                       |   |  |
| Master       | r's degr | ee (1 major) Computer                       | Science (2025)                                       |                       |   |  |

|   | itle  |                        |                       | Abbreviation                      |  |
|---|---|------------------------|-----------------------|-----------------------------------|--|
| Concluding Colloquium Computer Science 10-I-MA-MK-182-mo1 |   |                        |                       |                                   |  |
| Module c  | oordinator  | Module offered by      |                       |                                   |  |
| Dean of S   | Studies Informatik (Computer                                | Science)               | Institute of Comput   | er Science                        |  |
| ECTS N  | Aethod of grading   | Only after succ. con   | pl. of module(s)      |                                   |  |
| 5 (I  | not) successfully completed                                 |                        |                       |                                   |  |
| Duration  | Module level  | Other prerequisites    |                       |                                   |  |
| 1 semest  | er graduate   |                        |                       |                                   |  |
| Contents  |   |                        |                       |                                   |  |
| Presentat   | tion and defence of the result                              | s of the Master's thes | is in an open discus  | sion.                             |  |
| Intended  | learning outcomes   |                        |                       |                                   |  |
| The stude   | ents are able to present the re                             | sults of their Master' | s theses and defend   | them in a discussion.             |  |
| Courses   | (type, number of weekly conta                               | ct hours, language –   | · if other than Germa | in)                               |  |
| К (о)   |   |                        |                       |                                   |  |
| ster, info  | rmation on whether module c                                 |                        |                       | tion offered — if not every seme- |  |
|   | oquium (approx. 60 minutes)<br>e of assessment: German and, | /or English            |                       |                                   |  |
| Allocatio   | n of places   |                        |                       |                                   |  |
|   |   |                        |                       |                                   |  |
| Additiona   | al information  |                        |                       |                                   |  |
|   |   |                        |                       |                                   |  |
| Workload  | 1   |                        |                       |                                   |  |
| 150 h   |   |                        |                       |                                   |  |
| Teaching  | cycle   |                        |                       |                                   |  |
|   | •   |                        |                       |                                   |  |
| Referred  | to in LPO I (examination regu                               | lations for teaching-o | legree programmes)    |                                   |  |
|   |   |                        |                       |                                   |  |
| Module a  | ppears in   |                        |                       |                                   |  |
| Master's  | degree (1 major) Computer Sc                                | ience (2018)           |                       |                                   |  |

| Module title Abbreviation                  |  |                            |                        |                       |                                   |
|--|--|----------------------------|------------------------|-----------------------|-----------------------------------|
| Practical Course - Algorithms and Theory 1 |  |                            |                        |                       | 10-I-PAT1-182-m01                 |
| Module coordinator                         |  |                            |                        | Module offered by     | <u> </u>                          |
| Dean c                                     | of Studi                               | es Informatik (Computer    | Science)               | Institute of Comput   | ter Science                       |
| ECTS                                       | Meth                                   | od of grading              | Only after succ. con   | npl. of module(s)     |                                   |
| 10   | nume                                   | rical grade                |                        |                       |                                   |
| Durati                                     | on                                     | Module level               | Other prerequisites    |                       |                                   |
| 1 seme                                     | ester                                  | undergraduate              |                        |                       |                                   |
| Conter                                     | nts                                    |                            |                        |                       |                                   |
| Compl                                      | etion o                                | f a practical task.        |                        |                       |                                   |
| Intend                                     | led lear                               | ning outcomes              |                        |                       |                                   |
| The pr                                     | actical                                | allows participants to wo  | rk on a problem in als | gorithm and theory i  | n teams.                          |
| Course                                     | es (type                               | , number of weekly conta   | ct hours, language –   | - if other than Germa | an)                               |
| R (6)                                      |  | · · · · ·                  | · · · · ·              |                       |                                   |
| credita                                    | age of a<br>able for<br><b>tion of</b> |                            | /or English            |                       |                                   |
|  |  |                            |                        |                       |                                   |
|  |  | ormation                   |                        |                       |                                   |
| Focuse                                     | es avail                               | able for students of the N | laster's programme l   | nformatik (Compute    | r Science, 120 ECTS credits): AT. |
| Worklo                                     | oad                                    |                            |                        |                       |                                   |
| 300 h                                      |  |                            |                        |                       |                                   |
| Teachi                                     | ing cycl                               | e                          |                        |                       |                                   |
|  |  |                            |                        |                       |                                   |
| Referre                                    | ed to in                               | LPOI (examination regu     | lations for teaching-o | degree programmes)    |                                   |
|  |  |                            |                        |                       |                                   |
| Modul                                      | le appea                               | ars in                     |                        |                       |                                   |
|  | -                                      | ee (1 major) Computer Sc   |                        |                       |                                   |
|  | -                                      | ee (1 major) Computer Sc   |                        |                       |                                   |
|  |  | ee (1 major) Computer Sc   |                        |                       |                                   |
| Master                                     | r's degr                               | ee (1 major) Computer Sc   | ience (2025)           |                       |                                   |

| Modul                                      | le title                               |                            |   |                      | Abbreviation                      |
|--|--|----------------------------|---|----------------------|-----------------------------------|
| Practical Course - Algorithms and Theory 2 |  |                            |   |                      | 10-I-PAT2-182-m01                 |
| Modul                                      | le coord                               | inator                     |   | Module offered by    |                                   |
| Dean o                                     | of Studi                               | es Informatik (Computer    | Science)                                | Institute of Comput  | er Science                        |
| ECTS                                       |  | od of grading              | Only after succ. con                    | npl. of module(s)    |                                   |
| 10   | nume                                   | rical grade                |   |                      |                                   |
| Durati                                     | on                                     | Module level               | Other prerequisites                     |                      |                                   |
| 1 seme                                     | ester                                  | undergraduate              |   |                      |                                   |
| Conte                                      | nts                                    |                            |   |                      |                                   |
| Compl                                      | letion of                              | f a practical task.        |   |                      |                                   |
| Intend                                     | led lear                               | ning outcomes              |   |                      |                                   |
| The pr                                     | actical                                | allows participants to wo  | rk on a problem in al                   | gorithm and theory i | n teams.                          |
|  |  | , number of weekly conta   | · · · · ·                               | - ·                  |                                   |
| R (6)                                      |  | ,                          | , |                      |                                   |
| credita                                    | age of a<br>able for<br><b>tion of</b> |                            | or English                              |                      |                                   |
|  |  |                            |   |                      |                                   |
| Additi                                     | onal inf                               | ormation                   |   |                      |                                   |
| Focuse                                     | es avail                               | able for students of the N | laster's programme l                    | nformatik (Compute   | r Science, 120 ECTS credits): AT. |
| Workl                                      | oad                                    |                            |   |                      |                                   |
| 300 h                                      |  |                            |   |                      |                                   |
| Teachi                                     | ing cycl                               | e                          |   |                      |                                   |
|  |  |                            |   |                      |                                   |
| Referr                                     | ed to in                               | LPOI (examination regu     | lations for teaching-o                  | degree programmes)   |                                   |
|  |  |                            |   |                      |                                   |
| Modul                                      | le appea                               | ars in                     |   |                      |                                   |
| Maste                                      | r's degr                               | ee (1 major) Computer Sc   | ience (2018)                            |                      |                                   |
|  | -                                      | ee (1 major) Computer Sc   |   |                      |                                   |
|  | -                                      | ee (1 major) Computer Sc   |   |                      |                                   |
| Maste                                      | r's degr                               | ee (1 major) Computer Sc   | ience (2025)                            |                      |                                   |

| Module title Abbreviation  |  |  |   |                      |                                   |
|--|--|--|---|----------------------|-----------------------------------|
| Practical Course - Embedded Systems 1  |  |  |   |                      | 10-I-PES1-182-m01                 |
| Modul  | le coord   | inator   |   | Module offered by    | <u> </u>                          |
| Dean o   | of Studi   | es Informatik (Computer  | Science)  | Institute of Compu   | ter Science                       |
| ECTS   | -  | od of grading  | Only after succ. con  | · · · · ·            |                                   |
| 10   | nume   | rical grade  |   | •                    |                                   |
| Durati   | ion  | Module level   | Other prerequisites   | ;                    |                                   |
| 1 seme   | ester  | undergraduate  |   |                      |                                   |
| Conte  | nts  |  |   |                      |                                   |
| Compl  | letion o   | f a practical task.  |   |                      |                                   |
|  |  | ning outcomes  | -   |                      |                                   |
|  |  | allows participants to wo  | rk on a problem in en   | nbedded systems in   | teams.                            |
|  |  | , number of weekly conta   | · · · ·   | •                    |                                   |
| R (6)  |  |  |   | in other than define |                                   |
| Langua<br>credita  |  |  |   | minutes)             |                                   |
|  |  |  |   |                      |                                   |
| Additi   | onal inf   | ormation   |   |                      |                                   |
|  |  |  | Aaster's programme l  | nformatik (Compute   | r Science, 120 ECTS credits): ES. |
|  | es avail   |  | Aaster's programme I  | nformatik (Compute   | r Science, 120 ECTS credits): ES. |
| Focuse   | es avail   |  | Aaster's programme l  | nformatik (Compute   | r Science, 120 ECTS credits): ES. |
| Focuse<br><b>Workle</b><br>300 h   | es avail   | able for students of the N   | Aaster's programme I  | nformatik (Compute   | r Science, 120 ECTS credits): ES. |
| Focuse<br><b>Workle</b><br>300 h   | es avail<br><b>oad</b>   | able for students of the N   | Aaster's programme I  | nformatik (Compute   | r Science, 120 ECTS credits): ES. |
| Focuse<br>Workle<br>300 h<br>Teachi  | es avail<br>oad<br>ing cycl  | able for students of the N   |   |                      |                                   |
| Focuse<br>Workle<br>300 h<br>Teachi  | es avail<br>oad<br>ing cycl  | able for students of the N   |   |                      |                                   |
| Focuse<br>Workle<br>300 h<br>Teachi<br><br>Referre   | es avail<br>oad<br>ing cycl  | able for students of the A<br>e<br>LPOI (examination regu  |   |                      |                                   |
| Focuse<br>Workle<br>300 h<br>Teachi<br><br>Referre<br><br>Modul                            | es avail<br>oad<br>ing cycl<br>red to in<br>le appea                                     | able for students of the A<br>e<br>LPOI (examination regu  | lations for teaching-o  |                      |                                   |
| Focuse<br>Workle<br>300 h<br>Teachi<br><br>Referre<br><br>Modul<br>Maste                   | es avail<br>oad<br>ing cycl<br>red to in<br>le appea                                     | able for students of the A<br>e<br>LPOI (examination regu  | ulations for teaching-o   |                      |                                   |
| Focuse<br>Workle<br>300 h<br>Teachi<br><br>Referre<br><br>Modul<br>Maste<br>Maste<br>Maste | es avail<br>oad<br>ing cycl<br>red to in<br>le appea<br>r's degr<br>r's degr<br>r's degr | able for students of the A<br>e<br>LPO I (examination regu<br>ars in<br>ee (1 major) Computer So | ilations for teaching-<br>cience (2018)<br>cience (2021)<br>cience (2023) |                      |                                   |

| Module title Abbreviation             |  |  |                        |                                       |  |  |  |  |  |  |
|---------------------------------------|--|--|------------------------|---------------------------------------|--|--|--|--|--|--|
| Practical Course - Embedded Systems 2 |  |  |                        |                                       | 10-I-PES2-182-m01  |  |  |  |  |  |
| Module coordinator                    |  |  |                        | Module offered by                     |  |  |  |  |  |  |
| Dean o                                | of Studi   | es Informatik (Computer                              | Science)               | Institute of Comput                   | ter Science  |  |  |  |  |  |
| ECTS                                  | Meth   | od of grading  | Only after succ. con   | npl. of module(s)                     |  |  |  |  |  |  |
| 10                                    | nume   | rical grade  |                        |                                       |  |  |  |  |  |  |
| Durati                                | on   | Module level   | Other prerequisites    |                                       |  |  |  |  |  |  |
| 1 seme                                | ester  | undergraduate  |                        |                                       |  |  |  |  |  |  |
| Conter                                | nts  |  |                        |                                       |  |  |  |  |  |  |
| Compl                                 | etion o  | f a practical task.                                  |                        |                                       |  |  |  |  |  |  |
|                                       |  | ning outcomes  | _                      |                                       |  |  |  |  |  |  |
|                                       |  | allows participants to wo                            | ork on a problem in en | nbedded systems in                    | teams.   |  |  |  |  |  |
|                                       |  | , number of weekly conta                             |                        | · · · · · · · · · · · · · · · · · · · |  |  |  |  |  |  |
| R (6)                                 |  | ,  |                        |                                       |  |  |  |  |  |  |
| credita                               | age of a<br>able for<br><b>tion of</b>   |  | /or English            |                                       |  |  |  |  |  |  |
|                                       | 1 ! (  | · · · · · · · · · · · · · · · · · · ·                |                        |                                       |  |  |  |  |  |  |
|                                       |  | ormation   |                        |                                       |  |  |  |  |  |  |
| Focuse<br>Workle                      |  | able for students of the N                           | Master's programme i   | nformatik (Compute                    | r Science, 120 ECTS credits): ES.  |  |  |  |  |  |
| 300 h                                 | Jau  |  |                        |                                       |  |  |  |  |  |  |
| -                                     | ing cycl   | e  |                        |                                       |  |  |  |  |  |  |
|                                       |  |  |                        |                                       |  |  |  |  |  |  |
| Referre                               | ed to in   | LPOI (examination regu                               | ulations for teaching- | degree programmes)                    | )  |  |  |  |  |  |
|                                       |  |  |                        |                                       |  |  |  |  |  |  |
| Modul                                 | e appea  | ars in   |                        |                                       |  |  |  |  |  |  |
| Maste                                 | r's degr   | ee (1 major) Computer So                             | cience (2018)          |                                       |  |  |  |  |  |  |
|                                       | -  |  | cience (2021)          |                                       | Master's degree (1 major) Computer Science (2018)<br>Master's degree (1 major) Computer Science (2021) |  |  |  |  |  |
|                                       | Aaster's degree (1 major) Computer Science (2021)<br>Aaster's degree (1 major) Computer Science (2023) |  |                        |                                       |  |  |  |  |  |  |
|                                       |  | ee (1 major) Computer So<br>ee (1 major) Computer So |                        |                                       |  |  |  |  |  |  |

| Modul              |  |                                       |                        |                       | Abbreviation                       |
|--------------------|--|---------------------------------------|------------------------|-----------------------|------------------------------------|
| Practio            | cal Cour                                 | rse - Human Computer In               | teraction 1            |                       | 10-I-PHCl1-182-m01                 |
| Module coordinator |  |                                       |                        | Module offered by     |                                    |
| Dean c             | of Studi                                 | es Informatik (Computer               | Science)               | Institute of Compu    | ter Science                        |
| ECTS               | Meth                                     | od of grading                         | Only after succ. con   | pl. of module(s)      |                                    |
| 10                 | nume                                     | rical grade                           |                        |                       |                                    |
| Durati             | on                                       | Module level                          | Other prerequisites    |                       |                                    |
| 1 seme             | ester                                    | undergraduate                         |                        |                       |                                    |
| Conter             | nts                                      |                                       |                        |                       |                                    |
| Compl              | etion o                                  | f a practical task.                   |                        |                       |                                    |
|                    |  | ning outcomes                         | -                      |                       |                                    |
| The pr             | actical                                  | allows participants to wo             | rk on a problem in hu  | ıman computer intei   | ractions in teams.                 |
| Course             | es (type                                 | , number of weekly conta              | act hours, language –  | - if other than Germa | an)                                |
| R (6)              |  | , , , , , , , , , , , , , , , , , , , | , 0 0                  |                       | ·                                  |
| credita            | age of a<br>able for<br><b>tion of</b> [ |                                       | /or English            |                       |                                    |
|                    |  |                                       |                        |                       |                                    |
| Additio            | onal inf                                 | ormation                              |                        |                       |                                    |
| Focuse             | es avail                                 | able for students of the N            | Aaster's programme l   | nformatik (Compute    | r Science, 120 ECTS credits): HCl. |
| Worklo             | oad                                      |                                       |                        |                       |                                    |
| 300 h              |  |                                       |                        |                       |                                    |
| Teachi             | ing cycl                                 | e                                     |                        |                       |                                    |
|                    |  |                                       |                        |                       |                                    |
| Referre            | ed to in                                 | LPOI (examination regu                | llations for teaching- | degree programmes)    | )                                  |
|                    |  |                                       |                        |                       |                                    |
| Modul              | e appea                                  | ars in                                |                        |                       |                                    |
| Master             | r's degr                                 | ee (1 major) Computer So              | cience (2018)          |                       |                                    |
|                    | •  | ee (1 major) Computer So              |                        |                       |                                    |
|                    |  | ee (1 major) Computer So              |                        |                       |                                    |
| Macto              | r's degr                                 | ee (1 major) Computer So              |                        |                       |                                    |

| Modul   | le title                               |                            |                        |                       | Abbreviation                       |
|---|--|----------------------------|------------------------|-----------------------|------------------------------------|
| Practical Course - Human Computer Interaction 2 |  |                            |                        |                       | 10-I-PHCl2-182-m01                 |
| Module coordinator Mode                         |  |                            |                        | Module offered by     | Į                                  |
| Dean o  | of Studi                               | es Informatik (Computer    | Science)               | Institute of Comput   | ter Science                        |
| ECTS  | Meth                                   | od of grading              | Only after succ. con   | npl. of module(s)     |                                    |
| 10  | nume                                   | rical grade                |                        |                       |                                    |
| Durati  | on                                     | Module level               | Other prerequisites    |                       |                                    |
| 1 seme  | ester                                  | undergraduate              |                        |                       |                                    |
| Conte   | nts                                    |                            |                        |                       |                                    |
| Compl   | letion o                               | f a practical task.        |                        |                       |                                    |
| Intend  | led lear                               | ning outcomes              |                        |                       |                                    |
| The pr  | actical                                | allows participants to wo  | rk on a problem in hu  | ıman computer inter   | actions in teams.                  |
| Course  | es (type                               | , number of weekly conta   | ct hours, language –   | - if other than Germa | an)                                |
| R (6)   |  | ·                          | · · · · ·              |                       |                                    |
| credita   | age of a<br>able for<br><b>tion of</b> |                            | /or English            |                       |                                    |
|   |  |                            |                        |                       |                                    |
| Additi  | onal inf                               | ormation                   |                        |                       |                                    |
| Focuse  | es avail                               | able for students of the N | laster's programme l   | nformatik (Compute    | r Science, 120 ECTS credits): HCI. |
| Workl   | oad                                    |                            |                        |                       |                                    |
| 300 h   |  |                            |                        |                       |                                    |
| Teachi  | ing cycl                               | le                         |                        |                       |                                    |
|   |  |                            |                        |                       |                                    |
| Referr  | ed to in                               | LPOI (examination regu     | lations for teaching-o | degree programmes)    |                                    |
|   |  |                            |                        |                       |                                    |
| Modul   | le appea                               | ars in                     |                        |                       |                                    |
| Maste   | r's degr                               | ree (1 major) Computer Sc  | ience (2018)           |                       |                                    |
|   | -                                      | ree (1 major) Computer Sc  |                        |                       |                                    |
|   | -                                      | ree (1 major) Computer Sc  |                        |                       |                                    |
| Maste   | r's degr                               | ee (1 major) Computer Sc   | ience (2025)           |                       |                                    |

| Module title   |  | Abbreviation           |                        |                                   |  |  |
|--|--|------------------------|------------------------|-----------------------------------|--|--|
| Practical Cou  | rse - Intelligent System                                   |                        | 10-I-PIS1-182-m01      |                                   |  |  |
| Module coord   | linator  |                        | Module offered by      | <u> </u>                          |  |  |
| Dean of Stud   | ies Informatik (Compute                                    | r Science)             | Institute of Comput    | er Science                        |  |  |
| ECTS Meth  | od of grading  | Only after succ. con   | npl. of module(s)      |                                   |  |  |
| 10 nume  | erical grade   |                        |                        |                                   |  |  |
| Duration   | Module level   | Other prerequisites    |                        |                                   |  |  |
| 1 semester   | undergraduate  |                        |                        |                                   |  |  |
| Contents   |  |                        |                        |                                   |  |  |
| Completion o   | f a practical task.  |                        |                        |                                   |  |  |
| Intended lear  | ning outcomes  |                        |                        |                                   |  |  |
| The practical  | allows participants to w                                   | ork on a problem in in | telligent systems in t | teams.                            |  |  |
| Courses (type  | e, number of weekly cont                                   | tact hours, language – | - if other than Germa  | ın)                               |  |  |
| R (6)  |  |                        |                        |                                   |  |  |
|  | <b>sessment</b> (type, scope,<br>ion on whether module     |                        |                        | tion offered — if not every seme- |  |  |
|  | 15 pages) and presentati<br>assessment: German an<br>bonus |                        | minutes)               |                                   |  |  |
| Allocation of  | places   |                        |                        |                                   |  |  |
|  |  |                        |                        |                                   |  |  |
| Additional in  | formation  |                        |                        |                                   |  |  |
| Focuses avail  | able for students of the                                   | Master's programme l   | nformatik (Compute     | r Science, 120 ECTS credits): IS. |  |  |
| Workload   |  |                        |                        |                                   |  |  |
| 300 h  |  |                        |                        |                                   |  |  |
| Teaching cyc   | le   |                        |                        |                                   |  |  |
|  |  |                        |                        |                                   |  |  |
| Referred to ir   | LPOI (examination reg                                      | ulations for teaching- | degree programmes)     |                                   |  |  |
|  |  |                        |                        |                                   |  |  |
| Module appe  | ars in   |                        |                        |                                   |  |  |
| Module appears in<br>Master's degree (1 major) Computer Science (2018) |  |                        |                        |                                   |  |  |

| Modul                                    | e title             |  |  |                        | Abbreviation                      |
|--|---------------------|--|--|------------------------|-----------------------------------|
| Practical Course - Intelligent Systems 2 |                     |  |  |                        | 10-I-PIS2-182-m01                 |
| Module coordinator Mo                    |                     |  |  | Module offered by      |                                   |
| Dean o                                   | of Studi            | es Informatik (Computer  | Science)   | Institute of Comput    | er Science                        |
| ECTS                                     | Metho               | od of grading  | Only after succ. con                             | npl. of module(s)      |                                   |
| 10                                       | nume                | rical grade  |  |                        |                                   |
| Duratio                                  | on                  | Module level   | Other prerequisites                              |                        |                                   |
| 1 seme                                   | ester               | undergraduate  |  |                        |                                   |
| Conter                                   | nts                 |  |  |                        |                                   |
| Comple                                   | etion of            | a practical task.  | _  |                        |                                   |
| Intend                                   | ed lear             | ning outcomes  |  |                        |                                   |
| The pra                                  | actical a           | allows participants to wo  | ork on a problem in int                          | telligent systems in t | eams.                             |
| Course                                   | <b>s</b> (type      | , number of weekly cont  | act hours, language –                            | - if other than Germa  | n)                                |
| R (6)                                    |                     |  |  |                        |                                   |
| ster, in<br>report<br>Langua             | formati<br>(10 to 1 | on on whether module of 5 pages) and presentations seessment: German and | can be chosen to earn<br>on of results (15 to 30 | a bonus)               | tion offered — if not every seme- |
| Allocat                                  | tion of p           | olaces   |  |                        |                                   |
|  |                     |  |  |                        |                                   |
| Additio                                  | onal inf            | ormation   |  |                        |                                   |
| Focuse                                   | s availa            | able for students of the I   | Master's programme l                             | nformatik (Computer    | Science, 120 ECTS credits): IS.   |
| Worklo                                   | ad                  |  |  |                        |                                   |
| 300 h                                    |                     |  |  |                        |                                   |
| -  | ng cycl             | e  |  |                        |                                   |
|  |                     |  |  |                        |                                   |
| Referre                                  | ed to in            | LPOI (examination reg  | ulations for teaching-                           | degree programmes)     |                                   |
|  |                     | <b></b>  |  |                        |                                   |
|  |                     |  |  |                        |                                   |
| Modul                                    | e appea             | ars in   |  |                        |                                   |

| Module title Abbreviation                |          |                            |   |  |                                   |  |  |  |  |
|--|----------|----------------------------|---|--|-----------------------------------|--|--|--|--|
| Practical Course - Internet Technology 1 |          |                            |   |  | 10-I-PIT1-182-m01                 |  |  |  |  |
| Modul                                    | e coord  | inator                     |   | Module offered by  | l                                 |  |  |  |  |
| Dean c                                   | of Studi | es Informatik (Computer    | Science)                                | Institute of Compu   | ter Science                       |  |  |  |  |
| ECTS                                     | Meth     | od of grading              | Only after succ. con                    | npl. of module(s)  |                                   |  |  |  |  |
| 10                                       | nume     | rical grade                |   |  |                                   |  |  |  |  |
| Durati                                   | on       | Module level               | Other prerequisites                     |  |                                   |  |  |  |  |
| 1 seme                                   | ester    | undergraduate              |   |  |                                   |  |  |  |  |
| Conter                                   | nts      |                            |   |  |                                   |  |  |  |  |
| Compl                                    | etion o  | f a practical task.        |   |  |                                   |  |  |  |  |
|  |          | ning outcomes              | -                                       |  |                                   |  |  |  |  |
|  |          | allows participants to wo  | ork on a problem in int                 | ternet technology in   | teams.                            |  |  |  |  |
|  |          | , number of weekly conta   | - · · · · · · · · · · · · · · · · · · · |  |                                   |  |  |  |  |
| R (6)                                    |          | ,                          |   |  | ,                                 |  |  |  |  |
| Langua<br>credita                        |          |                            |   |  |                                   |  |  |  |  |
| Additio                                  | onal inf | ormation                   |   |  |                                   |  |  |  |  |
| Focuse                                   | es avail | able for students of the N | Aaster's programme li                   | nformatik (Compute   | r Science, 120 ECTS credits): IT. |  |  |  |  |
| Worklo                                   | oad      |                            |   |  |                                   |  |  |  |  |
| 300 h                                    |          |                            |   |  |                                   |  |  |  |  |
| Teachi                                   | ing cycl | e                          |   |  |                                   |  |  |  |  |
|  |          |                            |   |  |                                   |  |  |  |  |
| Referre                                  | ed to in | LPOI (examination regu     | ulations for teaching-o                 | degree programmes  | )                                 |  |  |  |  |
|  |          |                            |   |  |                                   |  |  |  |  |
| Modul                                    | e appea  | ars in                     |   |  |                                   |  |  |  |  |
| Master                                   | r's degr | ee (1 major) Computer So   | cience (2018)                           |  |                                   |  |  |  |  |
| Master                                   | r's degr | ee (1 major) Computer So   | cience (2021)                           |  |                                   |  |  |  |  |
| Master                                   | r's degr | ee (1 maior) Computer So   | rience (2022)                           | 1aster's degree (1 major) Computer Science (2021)<br>1aster's degree (1 major) Computer Science (2023) |                                   |  |  |  |  |
|  |          | ee (1 major) Computer So   |   |  |                                   |  |  |  |  |

| Module title Abbreviation                |          |                            |                        |                     |                                   |
|--|----------|----------------------------|------------------------|---------------------|-----------------------------------|
| Practical Course - Internet Technology 2 |          |                            |                        |                     | 10-I-PIT2-182-m01                 |
| Modul                                    | e coord  | inator                     |                        | Module offered by   |                                   |
| Dean c                                   | of Studi | es Informatik (Computer    | Science)               | Institute of Comput | ter Science                       |
| ECTS                                     | 1        | od of grading              | Only after succ. con   |                     |                                   |
| 10                                       |          | rical grade                |                        |                     |                                   |
| Duratio                                  | on       | Module level               | Other prerequisites    |                     |                                   |
| 1 seme                                   | ester    | undergraduate              |                        |                     |                                   |
| Conter                                   | nts      |                            |                        |                     |                                   |
| Compl                                    | etion o  | f a practical task.        |                        |                     |                                   |
|  |          | ning outcomes              |                        |                     |                                   |
|  |          | allows participants to wo  | rk on a problem in int | ernet technology in | teams.                            |
|  |          | , number of weekly conta   |                        |                     |                                   |
| R (6)                                    |          |                            |                        |                     | ,                                 |
| Langua<br>credita                        |          |                            |                        | minutes)            |                                   |
|  |          |                            |                        |                     |                                   |
| Additio                                  | onal inf | ormation                   |                        |                     |                                   |
| Focuse                                   | es avail | able for students of the N | laster's programme l   | nformatik (Compute  | r Science, 120 ECTS credits): IT. |
| Worklo                                   | oad      |                            |                        |                     |                                   |
| 300 h                                    |          |                            | -                      |                     |                                   |
| Teachi                                   | ing cycl | e                          |                        |                     |                                   |
|  |          |                            |                        |                     |                                   |
| Referre                                  | ed to in | LPOI (examination regu     | lations for teaching-o | legree programmes)  |                                   |
|  |          |                            |                        |                     |                                   |
| Modul                                    | e appea  | ars in                     |                        |                     |                                   |
| Master                                   | r's degr | ee (1 major) Computer Sc   | ience (2018)           |                     |                                   |
|  | •        | ee (1 major) Computer Sc   |                        |                     |                                   |
|  |          | ee (1 major) Computer Sc   |                        |                     |                                   |
| Master                                   | r's degr | ee (1 major) Computer Sc   | ience (2025)           |                     |                                   |

| Modul   | le title |                            | Abbreviation         |                               |                                   |  |  |  |
|---|----------|----------------------------|----------------------|-------------------------------|-----------------------------------|--|--|--|
| Practio   | cal Cou  | rse - Software Engineerin  |                      | 10-I-PSE1-182-m01             |                                   |  |  |  |
| Modul   | le coord | linator                    |                      | Module offered by             |                                   |  |  |  |
| Dean o  | of Studi | es Informatik (Computer    | Science)             | Institute of Computer Science |                                   |  |  |  |
| ECTS  | Meth     | od of grading              | Only after succ. con |                               |                                   |  |  |  |
| 10  | nume     | umerical grade             |                      |                               |                                   |  |  |  |
| 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 software engineering in teams.      |          |                            |                      |                               |                                   |  |  |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)        |          |                            |                      |                               |                                   |  |  |  |
| R (6)   |          |                            | , , , ,              |                               |                                   |  |  |  |
| Language of assessment: German and/or English<br>creditable for bonus<br>Allocation of places |          |                            |                      |                               |                                   |  |  |  |
|   |          |                            |                      |                               |                                   |  |  |  |
| Additi  | onal inf | ormation                   |                      |                               |                                   |  |  |  |
| Focuse  | es avail | able for students of the N | laster's programme l | nformatik (Compute            | r Science, 120 ECTS credits): SE. |  |  |  |
| Workl   | oad      |                            |                      |                               |                                   |  |  |  |
| 300 h   |          |                            |                      |                               |                                   |  |  |  |
| Teaching cycle  |          |                            |                      |                               |                                   |  |  |  |
|   |          |                            |                      |                               |                                   |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)          |          |                            |                      |                               |                                   |  |  |  |
|   |          |                            |                      |                               |                                   |  |  |  |
| Module appears in   |          |                            |                      |                               |                                   |  |  |  |
| Master's degree (1 major) Computer Science (2018)   |          |                            |                      |                               |                                   |  |  |  |
| Master's degree (1 major) Computer Science (2021)   |          |                            |                      |                               |                                   |  |  |  |
|   | -        | ee (1 major) Computer Sc   |                      |                               |                                   |  |  |  |
| Maste   | r's degr | ee (1 major) Computer Sc   | ience (2025)         |                               |                                   |  |  |  |

| Modul   | le title   |                            |                      | Abbreviation                  |                                   |  |  |  |
|---|--|----------------------------|----------------------|-------------------------------|-----------------------------------|--|--|--|
| Practio   | cal Cou  | rse - Software Engineerin  | g 2                  |                               | 10-I-PSE2-182-m01                 |  |  |  |
| Modul   | le coord   | linator                    |                      | Module offered by             |                                   |  |  |  |
| Dean o  | of Studi   | es Informatik (Computer    | Science)             | Institute of Computer Science |                                   |  |  |  |
| ECTS  |  | od of grading              | Only after succ. con |                               |                                   |  |  |  |
| 10  | nume   | numerical grade            |                      |                               |                                   |  |  |  |
| Duration Mo   |  | 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 software engineering in teams.      |  |                            |                      |                               |                                   |  |  |  |
| <b>Courses</b> (type, number of weekly contact hours, language — if other than German)        |  |                            |                      |                               |                                   |  |  |  |
| R (6)   |  |                            |                      |                               |                                   |  |  |  |
| Language of assessment: German and/or English<br>creditable for bonus<br>Allocation of places |  |                            |                      |                               |                                   |  |  |  |
|   |  |                            |                      |                               |                                   |  |  |  |
| Additi  | onal inf   | ormation                   |                      |                               |                                   |  |  |  |
| Focuse  | es avail   | able for students of the N | laster's programme l | nformatik (Compute            | r Science, 120 ECTS credits): SE. |  |  |  |
| Workle  | oad  |                            |                      |                               |                                   |  |  |  |
| 300 h   |  |                            |                      |                               |                                   |  |  |  |
| Teaching cycle  |  |                            |                      |                               |                                   |  |  |  |
|   |  |                            |                      |                               |                                   |  |  |  |
| <b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)          |  |                            |                      |                               |                                   |  |  |  |
|   |  |                            |                      |                               |                                   |  |  |  |
| Module appears in   |  |                            |                      |                               |                                   |  |  |  |
| Master's degree (1 major) Computer Science (2018)   |  |                            |                      |                               |                                   |  |  |  |
| Master's degree (1 major) Computer Science (2021)   |  |                            |                      |                               |                                   |  |  |  |
|   | Master's degree (1 major) Computer Science (2023)<br>Master's degree (1 major) Computer Science (2025) |                            |                      |                               |                                   |  |  |  |
| Maste   | r's degr   | ee (1 major) Computer Sc   | ience (2025)         |                               |                                   |  |  |  |