Information about the M.Sc. Computer Science programme for English-speaking students

This information is intended for students with no German language skills. There are additional courses taught in German in addition to those mentioned below: if you improve your German proficiency to an extent that you can follow the courses taught in German you will have a wider range of choices in this degree programme. Please refer to the German-language programme documentation for details on the German-taught courses.

Programme structure

You can put together your individual curriculum. All offered modules and courses are assigned to the respective focus areas and count as compulsory elective modules *('Wahlpflichtmodule')* or elective modules *('Wahlmodule')*. You should choose one primary focus area and two secondary focus areas. You can currently choose from three primary focus areas:

- Information and Communication Systems
- IT Security and Reliability
- Intelligent Technical Systems

You may choose from five secondary focus areas (but you cannot choose the same focus area as both your primary and secondary focus areas)

- Information and Communication Systems
- IT Security and Reliability
- Algorithmics and Mathematical Modelling
- Programming and Software Systems
- Intelligent Technical Systems

The focus areas *Algorithmics and Mathematical Modelling* and *Programming and Software Systems* do not have a sufficient number of English-taught modules to be offered as primary focus area at the moment. However, you may study individual modules from that area as 'freely selectable courses' in accordance with the rules below. In case of *Algorithmics and Mathematical Modelling* we expect this to change with the refilling of the chair of Theoretical Computer Science.

Degree requirements

To obtain the degree, you need to accumulate **120 credits** as follows:

- **30 credits for the thesis**, supervised by a professor in your primary focus area
- a **minimum of 30 credits from your primary focus area** (compulsory elective or elective modules), **including 18 credits from compulsory elective modules and one seminar**
- a **minimum of 12 credits from both of your secondary focus areas (compulsory elective modules only, i.e., elective modules do not count towards the required 12 ECTS credits)**
- 'Freely selectable courses': the residual credits may stem from any of the modules taught as part of the M.Sc. Computer Science programme, without restriction as to focus area or compulsory elective/elective status.

Some modules are eligible for multiple focus areas. You may include these modules according to the above-mentioned rules, but **each module will only count once**.

Link

http://www.fim.uni-passau.de/en/study/examinations/acceptability-for-credit-transfers/

Uni Passau→Faculty→Faculty of Computer Science and Mathematics→Study→Examinations→Acceptability: **list of English-taught courses**

Curriculum (as of October 2015, subject to change)

Compulsory elective modules for the Information and Communication Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5721	Computer Networking and Energy Systems		de Meer	6	de Meer
5723	Computer Performance Evaluation		de Meer	7	Basmadjian
5724	Sicherheit in Netzen	Network Security	de Meer	6	
5740	Transaktionssysteme	Transaction Systems	Freitag; Schenkel	7	
5742	Semantische Technologien	Semantic Technologies	Freitag; Schenkel	7	Schenkel
5771	Multimedia-Datenbanken	Multimedia Databases	Kosch	7	
5772	Web of Things and Services		Kosch	5	Kosch; Heuer, Jörg
5944	Web Mining Project		Granitzer	6	
5946	Visual Analytics		Granitzer	7	
5980	Text Mining		Handschuh	7	
5981	Text Mining Project		Handschuh	8	Handschuh

Elective modules for the Information and Communication Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5720	Modellierung und Beherrschung komplexer Systeme	Modeling and Control of Complex Systems	de Meer	7	
5722	Funktionale Sicherheit	Micro Controller Hardware Safety	de Meer	6	de Meer
5800	Mixed Reality		Kranz	5	Kranz; Grubert; Hölzl
5802	Spatial Augmented Reality		Kranz	5	
5820	IT-Sicherheit	Advanced IT-Security	Posegga	6	Posegga
5821	Wireless security		Posegga	5	Posegga
5823	Security Insider Lab I - Infrastructure Security		Posegga	12	Posegga
5842	Software Engineering II		Beyer	7	
5843	Software Verification		Beyer	7	
5880	Dependable Distributed Systems		Reiser	6	
5942	Social and User Centered Aspects of Web-based Information Systems		Granitzer	6	
5971	Machine Learning and Context Recognition		Amft	6	Amft

Compulsory elective modules for the IT Security and Reliability focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5762	Entwurfsautomatisierung	Electronic Design Automation	Polian	7	Polian
5763	Entwurf robuster Systeme	Design of Robust Systems	Polian	7	
5782	Kryptographie	Cryptography	Kreuzer	7	
5820	IT-Sicherheit	Advanced IT-Security	Posegga	6	Posegga
5821	Wireless security		Posegga	5	Posegga
5823	Security Insider Lab I - Infrastructure Security		Posegga	12	Posegga

Elective modules for the IT Security and Reliability focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5622	System Security		Posegga	5	
5721	Computer Networking and Energy Systems		de Meer	6	de Meer
5722	Funktionale Sicherheit	Micro Controller Hardware Safety	de Meer	6	de Meer
5723	Computer Performance Evaluation		de Meer	7	Basmadjian
5724	Sicherheit in Netzen	Network Security	de Meer	6	
5740	Transaktionssysteme	Transaction Systems	Freitag; Schenkel	7	
5767	Software-Hardware Codesign		Polian	6	Polian
5784	Codierungstheorie	Coding Theory	Kreuzer	7	
5822	Security Insider Lab II - System and Application Security		Posegga	12	
5824	Cloud Security		Posegga; Reiser	6	Reiser
5842	Software Engineering II		Beyer	7	
5843	Software Verification		Beyer	7	
5880	Dependable Distributed Systems		Reiser	6	
5881	Privacy Enhancing Techniques		Posegga	3	Posegga; Cuellar

Compulsory elective modules for the Algorithmics and Mathematical Modelling focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5670	Logik für Informatiker	Logics for Computer Scientists	Kreuzer	7	
5780	Computeralgebra	Computer Algebra	Kreuzer; Sauer	9	Kreuzer
5811	Stochastische Prozesse	Stochastic Processes	Müller-Gronbach	9	
5812	Stochastische Simulation	Stochastic Simulation	Müller-Gronbach	7	
5815	Computational stochastic processes		Müller-Gronbach	6	Müller-Gronbach

Elective modules for the Algorithmics and Mathematical Modelling focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5720	Modellierung und Beherrschung komplexer Systeme	Modeling and Control of Complex Systems	de Meer	7	
5723	Computer Performance Evaluation		de Meer	7	Basmadjian
5739	Geometric Modelling		Sauer	9	
5753	Signalanalyse	Signal Analysis	Forster-Heinlein	6	
5756	Funktionalanalysis	Functional analysis	Forster-Heinlein	9	
5757	Fourier- und Laplace-Transformation	Fourier and Laplace transform	Forster-Heinlein	9	
5762	Entwurfsautomatisierung	Electronic Design Automation	Polian	7	Polian
5782	Kryptographie	Cryptography	Kreuzer	7	
5784	Codierungstheorie	Coding Theory	Kreuzer	7	
5810	Statistische Datenanalyse	Statistical Data Analysis	Müller-Gronbach	9	
5843	Software Verification		Beyer	7	
5944	Web Mining Project		Granitzer	6	
5971	Machine Learning and Context Recognition		Amft	6	Amft
5980	Text Mining		Handschuh	7	
5981	Text Mining Project		Handschuh	8	Handschuh

More compulsory elective modules are to be expected after refilling of the chair of theoretical computer science.

Compulsory elective modules for the Programming and Software Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5790	Struktur und Implementierung von Programmiersprachen	Compiler Construction	Beyer	7	
5842	Software Engineering II	Software Engineering II	Beyer	7	
5843	Software Verification	Software Verification	Beyer	7	
5853	Empirische Methoden für Informatiker	Empirical Methods for Computer Scientists	Apel	6	

Elective modules for the Programming and Software Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5622	System Security	System Security	Posegga	5	
5721	Computer Networking and Energy Systems	Computer Networking III	de Meer	6	de Meer
5722	Funktionale Sicherheit	Micro Controller Hardware Safety	de Meer	6	de Meer
5820	IT-Sicherheit	Advanced IT-Security	Posegga	6	Posegga
5822	Security Insider Lab II - System and Application Security	Security Insider Lab II	Posegga	12	

More compulsory elective modules are taught only in German

Compulsory elective modules for the Intelligent Technical Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5734	Learning Theory		Sauer	9	Sauer
5739	Geometric Modelling		Sauer	9	
5753	Signalanalyse		Forster-Heinlein	6	
5800	Mixed Reality		Kranz	5	Kranz; Grubert; Hölzl
5802	Spatial Augmented Reality		Kranz	5	
5951	Intelligent Audio Analysis		Schuller	5	
5953	Intelligent Systems		Schuller	5	
5971	Machine Learning and Context Recognition		Amft	6	Amft

Elective modules for the Intelligent Technical Systems focus

Course number	Course title	Alternative English course title	Course convenor	ECTS	WS 2015/16
5622	System Security		Posegga	5	
5720	Modellierung und Beherrschung komplexer Systeme	Modeling and Control of Complex Systems	de Meer	7	
5721	Computer Networking and Energy Systems		de Meer	6	de Meer
5722	Funktionale Sicherheit	Micro Controller Hardware Safety	de Meer	6	de Meer
5723	Computer Performance Evaluation		de Meer	7	Basmadjian
5756	Funktionalanalysis	Functional analysis	Forster-Heinlein	9	
5757	Fourier- und Laplace-Transformation	Fourier and Laplace transform	Forster-Heinlein	9	
5762	Entwurfsautomatisierung	Electronic Design Automation	Polian	7	Polian
5763	Entwurf robuster Systeme	Design of Robust Systems	Polian	7	
5767	Software-Hardware Codesign		Polian	6	Polian
5810	Statistische Datenanalyse	Statistical Data Analysis	Müller-Gronbach	9	
5812	Stochastische Simulation	Stochastic Simulation	Müller-Gronbach	7	
5820	IT-Sicherheit	Advanced IT-Security	Posegga	6	Posegga
5821	Wireless security		Posegga	5	Posegga
5822	Security Insider Lab II - System and Application Security		Posegga	12	
5823	Security Insider Lab I - Infrastructure Security		Posegga	12	Posegga

5842	Software Engineering II		Beyer	7	
5843	Software Verification		Beyer	7	
5980	Text Mining		Handschuh	7	
5981	Text Mining Project		Handschuh	8	Handschuh

Examples of individual curricula

Sample Curriculum 1	Sample Curriculum 2
Primary focus area: **Information and Communication Systems** • Computer Performance Evaluation (compulsory elective, 7 credits) • Computer Networking and Energy Systems (compulsory elective, 6 credits) • Web of Things and Services (compulsory elective, 5 credits) • Visual Analytics (compulsory elective, 7 credits) • Cloud Security (elective, 6 credits) • Master seminar (4 credits) **Total: 35 (≥30) credits, including 25 (≥18) credits in compulsory elective modules**	*Primary focus area:* **IT Security and Reliability** • Security Insider Lab I (compulsory elective, 12 credits) • Wireless Security (compulsory elective, 5 credits) • Design of Robust Systems (compulsory elective, 7 credits) • Security Insider Lab II (elective, 12 credits) • Master seminar (4 credits) **Total: 40 (≥30) credits, including 24 (≥18) credits in compulsory elective modules**
Secondary focus area 1: **Algorithmics and Mathematical Modelling** • Logics for Computer Scientists (compulsory elective, 7 credits) • Computer Algebra (compulsory elective, 9 credits) **Total: 16 (≥12) credits in compulsory elective modules**	*Secondary focus area 1:* **Information and Communication Systems** • Web of Things and Services (compulsory elective, 5 credits) • Text Mining Project (compulsory elective, 8 credits) **Total: 13 (≥12) credits in compulsory elective modules**
Secondary focus area 2: **Programming and Software Systems** • Software Verification (compulsory elective, 7 credits) • Empirical Methods for Computer Scientists (compulsory elective, 6 credits) **Total: 13 (≥12) credits in compulsory elective modules**	*Secondary focus area 2:* **Intelligent Technical Systems** • Machine Learning and Context Recognition (compulsory elective, 6 credits) • Learning Theory (compulsory elective, 9 credits) **Total: 15 (≥12) credits in compulsory elective modules**
Freely selectable courses: • Text Mining Project (8 credits) • Mixed Reality (5 credits) • Electronic Design Automation (7 credits) • Design of Robust Systems (7 credits) **Total: 27 credits**	*Freely selectable courses:* • Logics for Computer Scientists (7 credits) • Empirical Methods for Computer Scientists (6 credits) • Computer Algebra (9 credits) **Total: 22 credits**
Thesis: 30 credits	*Thesis: 30 credits*
Overall Total: 121 (≥120) credits	*Overall Total: 120 (≥120) credits*