Universität Basel

Philosophisch-Naturwissenschaftliche Fakultät

Master Informatik

For information on the Master program in Computer Science and corresponding rules for graduation (required modules, achievements and credit points), please read the guidance document (German: Wegleitung für die Bachelor- und Masterstudiengänge in Informatik) on our homepage. http://informatik.unibas.ch/uploads/media/Wegleitung-BSc-MSc-PhD-Informatik-2010-EN_02.pdf

For more details on the courses designed for Master students please visit our homepage: http://www.informatik.unibas.ch

Studienfachberatung:
Ute Linder, Departement Mathematik und Informatik, Spiegelgasse 1, 4051 Basel, E-Mail: ute.linder@unibas.ch

Modul Kerninformatik

15728-01 + Vorlesung: Autonomic Computer Systems 6 KP

Dozierende	**Christian Tschudin**
Zeit	Di 14:15-16:00 Spiegelgasse 1, Seminarraum 00.003 Do 08:15-10:00 Spiegelgasse 1, Seminarraum 00.003
Beginndatum	15.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Kerninformatik (Master Informatik) (Pflicht) Modul Kerninformatik (MSF - Informatik) (Pflicht)
Inhalt	Operating large scale computer systems is a very challenging task: hardware failures, new software releases, variable application profiles and usage patterns, misconfigurations, security attacks and scaling problems all belong to a problem domain for which human intervention is still inevitable. In this lecture series we will investigate the (rather broad) research scope of autonomic computing (IBM's research and product initiative) as well as autonomic communications (EU Future and Emerging Technologies research program). Ultimately, computer systems should become self-configuring, self-diagnosing and self-healing. The goal of these lectures is to unravel some of the problems and complexity, explore existing management frameworks and analysis tools, and present current research efforts and directions towards this vision. This course includes mandatory exercices on system configuration, use of network management tools as well as large systems simulations.
Weblink	http://informatik.unibas.ch/hs2015/autonomic-computer-systems/
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	Successful completion of the excercises and oral examination. More details will be communicated during the lecture. Tentative dates for the oral exams are December 15 and 17 2015.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Bemerkungen	Target Audience: Computer Science Master Students

15729-01 + Vorlesung: Distributed Information Systems 6 KP

Dozierende	**Heiko Schuldt**
Zeit	Do 10:15-12:00 Spiegelgasse 5, Seminarraum 05.001 Fr 10:15-12:00 Kollegienhaus, Seminarraum 106
Beginndatum	17.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Kerninformatik (Master Informatik) (Pflicht) Modul Kerninformatik (MSF - Informatik) (Pflicht)
Lernziele	The goal of this course is to understand the basic problems of distributed information systems, to become familiar with the different architecture paradigms, and to practically experiment with some selected systems. The course starts with distributed databases and in particular with protocols for distributed transactions and replication management.

Inhalt	Many applications are more and more facing large volumes of data which need to be managed, accessed, and processed in an efficient way. Examples can be found in eHealth, banking and insurance, eScience, digital libraries, etc. From the data management point of view, this has led to a radical shift from centralized, monolithic database systems towards distributed information systems. For these systems, it is of utmost importance i.) to have sophisticated mechanisms and protocols for coordinating and accessing distributed resources (e.g., distributed databases) and ii.) to be based on appropriate infrastructures which support distributed applications. The goal of this course is to understand the basic problems of distributed information systems, to become familiar with the different architecture paradigms, and to practically experiment with some selected systems. The course starts with distributed databases and in particular with protocols for distributed transactions and replication management. Different middleware frameworks for implementing distributed information systems are addressed (e.g., Enterprise JavaBeans) and novel architectures such as P2P systems, Cloud infrastructures, and service-oriented architectures are explored. Finally, also workflow management and process-orientation in information systems which is essential for building advanced applications in distributed information systems are investigated. The course includes both lectures and mandatory practical exercises with some of the systems and infrastructures that are discussed.
Literatur	Will be announced in the course.
Weblink	http://informatik.unibas.ch/hs2015/distributed-information-systems/
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	Oral examinations and project presentations. The oral examination will contribute 2/3, the project presentations 1/3 to the final grade. Admission to the oral examination requires at least 75% of the points from the exercises. Oral exams will take place on January 21 & 22 2016. A date for the project presentations will be announced in October 2015.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Teilnahmevoraussetzungen	You sucessfully completed the following Bachelor courses or have at your command the corresponding skills: Basics of Programming, Programming Project, Web Data Management, peferrably also Databases.
Bemerkungen	Target Audience: Students in the Master Program Computer Science

15728-02 Übung: Autonomic Computer Systems 6 KP

Dozierende	**Christian Tschudin**
Zeit	Di 09:15-12:00 Spiegelgasse 1, Seminarraum 00.003
Beginndatum	22.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Kerninformatik (Master Informatik) (Pflicht) Modul Kerninformatik (MSF - Informatik) (Pflicht)
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	kein spezifischer Einsatz
Unterrichtssprache	Deutsch

15729-02 Übung: Distributed Information Systems 6 KP

Dozierende	**Heiko Schuldt**
Zeit	Do 12:15-14:00 Spiegelgasse 1, Computer-Labor U1.001
Beginndatum	17.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik

Module	Modul Kerninformatik (Master Informatik) (Pflicht) Modul Kerninformatik (MSF - Informatik) (Pflicht)
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	kein spezifischer Einsatz
Unterrichtssprache	Deutsch

Modul Seminar

16943-01 Projekt: Life Science Informatics 3 KP

Dozierende	**Volker Roth**
Zeit	Mo 14:15-16:00
Beginndatum	21.09.2015
Intervall	unregelmässig
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Seminar (Master Informatik) Modul Praxis aktueller Informatikmethoden (MSF - Informatik)
Weblink	http://informatik.unibas.ch/lehre/index.html
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	Pass / Fail
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	3 ECTS for completion of a software project in the field of Life Science Informatics.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Teilnahmevoraussetzungen	Participation in the seminar Life Science Informatics (CS302) is a prerequisite for participation in the project (CS303).

31725-01 + Projekt: Search <(>&<)> Optimization 3 KP

Dozierende	**Malte Helmert** Martin Wehrle
Zeit	Do 15:15-17:00
Beginndatum	17.09.2015
Intervall	unregelmässig
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Seminar (Master Informatik) Modul Praxis aktueller Informatikmethoden (MSF - Informatik)
Lernziele	* Designing and implementing state-of-the-art algorithms for search and optimization. * Rigorous scientific evaluations of algorithms. * Practicing programming skills, especially with respect to clean and efficient code. * Practicing work in teams. * Practicing the communication of research results.
Inhalt	The project extends the seminar "Search & Optimization". Participation in the seminar is obligatory. Hence, see also the description of the seminar. In the project, the participants develop algorithms to solve specific search and optimization problems in the context of computer games. Starting from simple solvers, the participants gradually implement an efficient solver based on state-of-the-art search techniques. Participants will be able to work in teams of two students. We will emphasize a structured approach to problem solving and a scientific evaluation of the resulting solver.
Literatur	Literature references will be provided individually on request.
Weblink	TBA
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende

Hinweise zur Leistungsüberprüfung	Participants are required to submit their project code at various milestones throughout the semester and conduct a scientific evaluation of its performance. The code for the individual milestones and the evaluation will be graded individually on a scale of 1.0-6.0, and the overall grade for the seminar will be determined as a weighted average of these components.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Teilnahmevoraussetzungen	Participation in the seminar Search & Optimization is a prerequisite for participation in the project. In addition, the participants are expected to have knowledge of the algorithms and concepts of the Foundations of AI course or be willing to study the relevant topics independently. Programming skills, ideally in the C++ language, are required.
Anmeldung zur Lehrveranstaltung	https://services.unibas.ch

16261-01 Seminar: Life Science Informatics 3 KP

Dozierende	**Volker Roth**
Zeit	Mo 14:15-16:00 Spiegelgasse 5, Seminarraum 05.001
Beginndatum	21.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Seminar (Master Informatik) Modul Praxis aktueller Informatikmethoden (MSF - Informatik)
Inhalt	Selected topics in biological sequence analysis (alignments, hidden Markov models, phylogenetic trees etc.)
Weblink	http://informatik.unibas.ch/hs2015/seminar-life-science-informatics/
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	Pass / Fail
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	Assesssed student presentation (3 ECTS); Optional: Additional 3 ECTS for successful completion of a software project.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Bemerkungen	Target Audience: Students in the Master Program Computer Science (and related subjects).

31706-01 + Seminar: Search & Optimization 3 KP

Dozierende	**Malte Helmert** Martin Wehrle
Zeit	Do 15:15-17:00 Spiegelgasse 1, Seminarraum 00.003
Beginndatum	17.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Modul Seminar (Master Informatik) Modul Praxis aktueller Informatikmethoden (MSF - Informatik)
Lernziele	* Developing knowledge about the history and state of the art in (certain areas of) search and optimization. * Reading and understanding scientific literature. * Analyzing and comparing algorithms. * Understanding the link between the guiding intuitions of an algorithm and its concrete design. * Developing and presenting scientific talks. * Conducting scientific discussions with peers. * Writing scientific reports.
Inhalt	Search and optimization are central topics in artificial intelligence and other areas of computer science. The seminar will focus on search and optimization problems in the context of computer games.

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Literatur	Literature references for each seminar topic will be provided on the seminar page at the start of the semester.
Weblink	http://informatik.unibas.ch/hs2015/seminar-search-optimization/
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	Participants are required to submit a written report on their seminar topic, present a talk on the topic, and participate actively in the seminar discussions. These three aspects will be individually graded on a scale of 1.0-6.0, and the overall grade for the seminar will be determined as a weighted average of the three components.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Teilnahmevoraussetzungen	Foundations of Artificial Intelligence or willingness to study the relevant topics independently.
Anmeldung zur Lehrveranstaltung	https://services.unibas.ch
Bemerkungen	Target audience: students in the master program Computer Science (and related subjects); the number of participants is limited to 16. The places are allocated on a first-come first-served basis. 3 ECTS for the seminar and 3 ECTS for the (optional) software project.

Wahlbereich Master Informatik: Empfehlungen

21067-01 + Vorlesung mit Übungen: Software Life-Cycle Management 6 KP

Dozierende	**Ingo Arnold**
Zeit	Mo 16:15-19:00 Spiegelgasse 5, Seminarraum 05.001
Beginndatum	21.09.2015
Intervall	wöchentlich
Angebotsmuster	Jedes Herbstsemester
Anbietende Organisationseinheit	Fachbereich Informatik
Module	Wahlbereich Master Informatik: Empfehlungen (Master Informatik) Modul Praxis aktueller Informatikmethoden (MSF - Informatik)
Lernziele	Upon completion of the course students will be able to use industry best-practice process models in the field of software life cycle management and to integrate their individual skills and knowledge when working on complex problems and tasks in real life settings.
Inhalt	Throughout the course of their academic studies, students usually gain comprehensive insights into computer science theories and concepts as well as a broad range of related technologies and techniques. But they often lack an understanding of how to practically combine their individual abilities and and subject matter knowledge when working on complex problems and real life tasks. This lecture's intention is to close this gap. It will set a broad range of software architecture, software engineering and software life-cycle management subjects into perspective of iterative and industry best-practice process models and thus provide a holistic view onto software architecture and project management as well as operational aspects.
Weblink	http://informatik.unibas.ch/hs2014/software-life-cycle-management/
Leistungsüberprüfung	Lehrveranst.-begleitend
Skala	1-6 0,5
Wiederholungsprüfung	keine Wiederholungsprüfung
An-/Abmeldung	Anmelden: Belegen; Abmelden: Dozierende
Hinweise zur Leistungsüberprüfung	Oral exam. Details will be communicated during the lecture. The case study / project students have to work on during the semester will be evaluated as well. The marks students get for their case study assignments / deliverables will contribute 30% and the oral exam marks will count 70% into their overall lecture mark.
Wiederholtes Belegen	beliebig wiederholbar
Präsenz/E-Learning	Online-Angebot obligatorisch
Unterrichtssprache	Englisch
Teilnahmevoraussetzungen	Java/JEE programming; basic knowledge on data bases, distributed computing systems, and software engineering.
Bemerkungen	Target Audience: Students in computer science