

LIST OF COURSES FROM THE INTERNATIONAL PROGRAMME *COMPUTING*

The International Programme is a 12 week programme which takes place twice a year, from **October to December** and from **March to May**.

Semester dates:

September till February (Winter Semester)

March till August (Summer Semester)

Application deadline:

Deadline winter semester - **30.04.**

Deadline spring semester - **31.10.**

Please find more information online: www.dhbw-stuttgart.de/incomings

Please note that the classes from the International Programme may change depending on the number of applicants for the specific class (the minimum number of participants 5)

10-12 hours of lecture pro 1 ECTS

1 credit (ECTS) = 30 hours of work

<p>1.</p>	<p>SYSTEM ANALYSIS AND SYSTEM DESIGN</p> <p>Course objectives and content outline:</p> <p>One of the toughest problems in developing IT systems is to extract the relevant information regarding requirements from interviews with non-IT experts. The course will introduce into concepts to extract functional requirements from natural language and to document the information in a standardized notation using the Unified Modeling Language (UML). Multiple models and techniques will be introduced to support the different phases of a project from a first high-level sketch to the implementation. Models to document static aspects as well as models for dynamic aspects will be introduced.</p> <p>The course will be a mixture of theory and practical assignments. During the assignments we will use modeling tools to develop models from recorded interviews.</p> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS Working language(s): English</p>
<p>2.</p>	<p>DATABASE DESIGN AND IMPLEMENTATION</p> <p>Course objectives and content outline:</p> <p>The course introduces into data modeling techniques. Entity-Relationship-Model concepts are introduced and the differences to relational modeling will be explained. As a next step the data definition language part of SQL is introduced. The course will then discuss ways to transform the relational model into structured query language (SQL) statements to create a physical database schema. Finally, the basic elements of the data manipulation language part of SQL will be introduced.</p> <p>The course will be a mixture of theory and practical parts. During the practical parts we will use graphical tools to create models and we will use a real SQL database to create schemas. Furthermore, we will develop scripts to manipulate and retrieve the data that is stored in the database.</p> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS Working language(s): English</p>

<p>3.</p>	<p>INFORMATION TECHNOLOGY SERVICE MANAGEMENT (ITSM1)</p> <hr/> <p>Course objectives and content outline:</p> <ul style="list-style-type: none"> • The lifecycle of Information Technology Infrastructure Library V3 (ITIL® V3) • ITSM Governance: Association and Dependency to the Business • Process oriented structures for ITSM and compliance • IT-Services; Structure and Implementation • Operational IT Setup • IT Outsourcing • Contracts and Service Level Managemen • Financial aspects • Quality Management <hr/> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS (ITIL® V3 Service Lifecycle at foundation level; ITSM 1) Working language(s): English</p>
<p>4.</p>	<p>INFORMATION TECHNOLOGY SERVICE MANAGEMENT (ITSM2)</p> <hr/> <p>Course objectives and content outline:</p> <ul style="list-style-type: none"> • The lifecycle of Information Technology Infrastructure Library V3 (ITIL® V3) • ITSM Governance: Association and Dependency to the Business • Process oriented structures for ITSM and compliance • IT-Services; Structure and Implementation • Operational IT Setup • IT Outsourcing • Contracts and Service Level Managemen • Financial aspects • Quality Management <hr/> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS (All other ITSM aspects mentioned above; ITSM 2) Working language(s): English</p>
<p>5.</p>	<p>USABILITY WORKSHOP</p> <hr/> <p>Course objectives and content outline:</p> <ul style="list-style-type: none"> • Fundamentals of Human-Computer-Interaction • Usability/User Experience • Human Factors of Perception • Knowledge of DIN ISO 9241 • Processes of User-centered Design • Methodologies of Usability Reviews • Usability Inspection techniques • Usability Patterns, Guidelines, Heuristics etc. • Introduction to Persons (target groups) <hr/> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS Working language(s): English</p>

<p>6.</p>	<p>GENETIC ALGORITHMS</p> <hr/> <p>Course objectives and content outline:</p> <ul style="list-style-type: none"> • Combinatorial optimization problems • Search paradigm of genetic algorithms • Coding and decoding approaches • Search operators: crossover, mutation, and selection • Theory • Business applications and implementation • Case study <hr/> <p>40 hours of lecture / 110 hours of independent study / 5 ECTS Working language(s): English</p>
<p>7.</p>	<p>COMPUTER VISION</p> <hr/> <p>Course objectives and content outline: Introduction to Computer Vision</p> <p>This Lecture focuses on the fast growing field of „Seeing Machines“ in the context of Artificial Intelligence. During the class we start with basics in light, cameras, and optics. Very quickly we jump into the algorithmic challenges of edge detection, interest points, and local image features in general. Further topics include the Hough transform, stereo vision, feature tracking and optical flow.</p> <p>The class has a strong application orientation inspired by the lecturer who actively works in the field of autonomous driving in the car industry.</p> <p>Your final grade will be made up from small programming projects and a presentation of a topic of your choice in the domain of the Field of Machine Vision. There will be no written exam.</p> <p>Whoever has some deeper interest: Here is the recommended literature: "Computer Vision: Algorithms and Applications" by Richard Szeliski. The book is available for free online (http://szeliski.org/Book/) or available for purchase.</p> <hr/> <p>32 hours of lecture / 118 hours of independent study / 3 ECTS Working language(s): English</p>
<p>8.</p>	<p>IT SECURITY</p> <hr/> <p>Course objectives and content outline:</p> <p>Part 1 : Cryptography</p> <p>Basics of cryptographic systems, history of cryptography, known historical examples and implications for today's technologies, steganography and graphical methods, fundamentals and overview of modern encryption algorithms, logic circuits, blocks and shift registers in the e- technology, industry-standard encryption algorithms and their implementation by means of concrete examples from the current practice, modern applications of various encryption methods, digital signatures, certificates, PKI, IPSEC, SSL, etc., vulnerabilities and design flaws of modern encryption methods, overview of common attack methods using current examples from industry practice (eg GSM/A5-1 real time hack, fake certificates)</p> <p>Part 2 : Network and Computer Security</p> <p>History of network technology and computer communication, history and basics of internet communication, overview and introduction to the main or current network protocols, Focus on TCP / IP,</p>

	<p>security vulnerabilities in the implementation in today's applications and infrastructure, design of a typical network infrastructure and analysis of security-related vulnerabilities, Introduction to common attack methods, introduction to current computer or network security technologies, Focus : VPN infrastructures, firewalls and IDS (intrusion detection systems), structure, functioning and implementation of modern virus scanners, Focus: Vulnerabilities in WLANs and current attack methods and their detection / countermeasures, "hands-on" configuration of a modern IDS , planning example / tutorial "Building a secure network infrastructure covering multiple locations and home offices"</p>
	<p>40 hours of lecture / 110 hours of independent study / 5 ECTS Working language(s): English</p>
9.	<p>DIGITAL STORY TELLING AND SOCIAL MEDIA CAMPAIGNING (EXCURSION TO THE BOSCH COMPANY)</p>
	<p>Course objectives and content outline:</p> <p>In contrast to abstract information, stories are illustrative and easily memorable. Great stories win hearts and minds – and allow companies to create stronger emotional bonds with their customers and other stakeholders. That is why more and more global brands have been starting to rely on the advantages of storytelling when creating content for their websites and presences on social media platforms like Facebook, Twitter, and YouTube.</p> <p>In this course, firstly a brief introduction to Public Relations and Content Marketing in general will be given. By analyzing international campaigns, students will learn and discuss what makes a good story, how brand stories can be successfully told in the digital world and how the specifics of social media influence the ways stories are told and perceived. Students will also learn how a storytelling framework helps orchestrate cross-platform experiences of the users of a brand's various digital activities.</p>
	<p>20 hours of lecture / 40 hours of independent study / 2 ECTS Working language(s): English</p>
10.	<p>EXCURSION TO THE IBM COMPANY</p>
	<p>Course objectives and content outline:</p>
	<p>6 hours of lecture / 4 hours of independent study / 1 ECTS Working language(s): English</p>
11.	<p>GERMAN LANGUAGE</p>
	<p>Course objectives and content outline:</p> <p>Different levels depending on the language knowledge and the number of participants.</p>
	<p>36 hours of lecture / 54 hours of independent study / 3 ECTS Working language(s): German</p>