Module Catalogue
Master of Science Cognitive Systems: Language, Learning and Reasoning
valid as of Winter Semester 2014/2015

<table>
<tr><td colspan="3">AM11: Current Topics in Computational Linguistics 1</td><td colspan="2">Total Credits:
6 CP (Credit Points)</td></tr>
<tr><td>Module type (compulsory/ elective module)</td><td colspan="4">Elective module</td></tr>
<tr><td>Module content and learning outcomes:</td><td colspan="4">Intended learning outcomes:
- Students can independently review the current relevant scholarly literature on a given topic.
- Building on the knowledge acquired in BM1, students develop a deeper understanding of specific current topics in computational linguistics: Which solutions are being pursued, what are their strengths and weaknesses?
- Students are able to critically examine research work, i.e. question arguments, check the suitability of selected solutions and consider alternatives.

Syllabus:
Topics are selected from the current international computational linguistics literature (conferences, journals), which are discussed in depth based on the knowledge gained in the BM modules.
The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture.
Enrollment in the AM12 module enables the student to further specialize in computational linguistics.</td></tr>
<tr><td>(Sub) module exam(s) (number, type, scope):</td><td colspan="4">For course-related (sub) module exam(s) see below</td></tr>
<tr><td>Self-study time (hours):</td><td colspan="4">150</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td rowspan="2">Courses (teaching format)</td><td rowspan="2">Contact hours (hours per week)</td><td colspan="2">Exam prerequisites (number, type, scope)</td><td rowspan="2">Course-related (sub) module exam(s) (number, type, scope)</td></tr>
<tr><td>For completing the module</td><td>For admission to module exam</td></tr>
<tr><td>Lecture or seminar (lecture or seminar)</td><td>2</td><td>-</td><td>-</td><td>If seminar: portfolio examination consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); if lecture: written exam (90 min) or oral exam (20 min).</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td colspan="2">Frequency:</td><td colspan="3">Each semester</td></tr>
<tr><td colspan="2">Prerequisites for participating in the module:</td><td colspan="3">None</td></tr>
</table>

Department offering the module:	Linguistics

AM12: Current Topics in Computational Linguistics 2			Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module		
Module content and learning outcomes:	*Intended learning outcomes:* - Students can independently review the current relevant scholarly literature on a given topic. - Building on the knowledge acquired in BM1, students develop a deeper understanding of specific current topics in computational linguistics: Which solutions are being pursued, what are their strengths and weaknesses? - Students are able to critically examine research work, i.e. question arguments, check the suitability of selected solutions and consider alternatives. *Syllabus:* Topics are selected from the current international computational linguistics literature (conferences, journals), which are discussed in depth based on the knowledge gained in the BM modules. The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture. Enrollment in the AM12 module enables the student to further specialize in computational linguistics.		
(Sub) module exam(s) (number, type, scope):	For course-related (sub) module exam(s) see below		
Self-study time (hours):	150		
Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)	Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture or seminar (lecture or seminar)	2	-	-	If seminar: portfolio examination, consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); registration for the module exam takes place when registering for the seminar. If lecture: written exam (90 min) or oral exam (20 min)

Frequency:	Each semester
Prerequisites for participating in the module:	None
Department offering the module:	Linguistics

AM21: Current Topics in Machine Learning 1				Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module			
Module content and learning outcomes:	*Intended learning outcomes* Students have extensive, detailed, and specialized knowledge that is in line with the state of the art in selected special areas of machine learning. They have advanced knowledge in the adjacent field of Bayesian statistics. Students are able to analyze modelling problems, map them onto machine learning paradigms and Bayesian statistics, develop and implement solutions, and determine the quality of the solutions using suitable evaluation protocols. They are able to develop new ideas and procedures, weigh alternatives if the information is incomplete, and evaluate them using different assessment criteria. *Syllabus* Selection of advanced topics from the field of machine learning, e.g. graphic models, Gaussian processes, inference, reinforcement learning, online learning, transfer learning, kernel procedures, recommendation algorithms. The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture. Enrollment in the AM22 module enables the student to further specialize in machine learning.			
(Sub) module exam(s) (number, type, scope):	For course-related (sub) module exam(s) see below			
Self-study time (hours):	150			
Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture or seminar (lecture or seminar)	2	-	-	If seminar: portfolio examination consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); if lecture: written exam (90 min) or oral exam (20 min).
Frequency:	Each semester			
Prerequisites for participating in the module:	None			

Departments offering the module:	Computer Science (50%) Linguistics (50%)

AM22: Current Topics in Machine Learning 2				Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module			
Module content and learning outcomes:	*Intended learning outcomes* Students have extensive, detailed, and specialized knowledge that is in line with the state of the art in selected special areas of machine learning. They have advanced knowledge in the adjacent field of Bayesian statistics. Students are able to analyze modelling problems, map them onto machine learning paradigms and Bayesian statistics, develop and implement solutions, and determine the quality of the solutions using suitable evaluation protocols. They are able to develop new ideas and procedures, weigh alternatives if the information is incomplete, and evaluate them using different assessment criteria. *Syllabus* Selection of advanced topics from the field of machine learning, e.g. graphic models, Gaussian processes, inference, reinforcement learning, online learning, transfer learning, kernel procedures, recommendation algorithms. The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture. Enrollment in the AM22 module enables the student to further specialize in machine learning.			
(Sub) module exam(s) (number, type, scope):	For course-related (sub) module exam(s) see below			
Self-study time (hours):	150			
Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture or seminar (lecture or seminar)	2	-	-	If seminar: portfolio examination consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); if lecture: written exam (90 min) or oral exam (20 min).
Frequency:	Each semester			
Prerequisites for participating in the module:	None			
Departments offering the module:	Computer Science (50%) Linguistics (50%)			

AM31: Current Topics in Computational Intelligence 1	Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module
Module content and learning outcomes:	*Intended learning outcomes* - Students are able to define and interpret special aspects, limits, terminologies, and doctrines in the field of computational intelligence. - Their knowledge and comprehension forms the basis for developing and/ or applying independent and research-oriented ideas in computational intelligence. - Students have a broad, detailed, and critical understanding of state-of-the-art knowledge in selected areas of computational intelligence. - Students are able to apply their knowledge and comprehension as well as their problem-solving skills in new and unfamiliar situations that have a wider or multidisciplinary connection to knowledge representation and processing. *Syllabus* Selection of advanced topics from the field of computational intelligence, e.g. logical basics, exact reasoning, error-tolerant reasoning, temporal and spatial reasoning, taxonomic systems, argumentative systems, autonomous systems, action planning, configuration, diagnosis, multidimensional constraint satisfaction problems, etc. The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture. Enrollment in the AM32 module enables the student to further specialize in computational intelligence.
(Sub) module exam(s) (number, type, scope):	For course-related (sub) module exam(s) see below.
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture or seminar (lecture or seminar)	2	-	-	If seminar: portfolio examination consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); if lecture: written exam (90 min) or oral exam (20 min).

Frequency:	Each semester
Prerequisites for participating in the module:	None
Department offering the module:	Computer Science

AM32: Current Topics in Computational Intelligence 2	Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module
Module content and learning outcomes:	*Intended learning outcomes* Students are able to define and interpret special aspects, limits, terminologies, and doctrines in the field of computational intelligence. Their knowledge and comprehension forms the basis for developing and/ or applying independent and research-oriented ideas in computational intelligence. Students have a broad, detailed, and critical understanding of state-of-the-art knowledge in selected areas of computational intelligence. Students are able to apply their knowledge and comprehension as well as their problem-solving skills in new and unfamiliar situations that have a wider or multidisciplinary connection to knowledge representation and processing. *Syllabus* Selection of advanced topics from the field of computational intelligence, e.g. logical basics, exact reasoning, error-tolerant reasoning, temporal and spatial reasoning, taxonomic systems, argumentative systems, autonomous systems, action planning, configuration, diagnosis, multidimensional constraint satisfaction problems, etc. The courses in this module are usually seminars; depending on the topic, some may also be offered as a lecture. At the end of the module, the student completes either a seminar or a lecture. Enrollment in the AM32 module enables the student to further specialize in computational intelligence.
(Sub) module exam(s) (number, type, scope):	For course-related (sub) module exam(s) see below.
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture or seminar (lecture or seminar)	2	-	-	If seminar: portfolio examination consisting of a presentation (60 min) and a related seminar paper (approx. 20 pages); if lecture: written exam (90 min) or oral exam (20 min).

Frequency:	Each semester

Prerequisites for participating in the module:	None
Department offering the module:	Computer Science

BM1: Advanced Natural Language Processing				Total Credits: 9 CP (Credit Points)
Module type (compulsory/ elective module)	Compulsory module			
Module content and learning outcomes:	*Intended learning outcomes:* - Students have broad and well-founded knowledge of the methods and applications of computational linguistics. On this basis, they are able to understand and critically contextualize current computational linguistics literature. They are trained to independently review literature. - Students are able to select and use suitable methods for specific, given computational linguistic problems. - Students are able to implement computational linguistic algorithms in a suitable programming language. They know the commonly available grammars and data sets and are able to use and, if necessary, to process them for the respective problems. *Syllabus:* The course covers the most important applications of computational linguistics as well as the modeling approaches and associated algorithms used in these applications. It focuses on symbolic and statistical methods for parsing, generation, part-of-speech tagging, semantic processing, discourse processing and machine translation. The lecture is accompanied by exercises and intensive self-study (textbook, research literature).			
(Sub) module exam(s) (number, type, scope):	written exam, 120 minutes final project, project report of approx. 10 pages			
Self-study time (hours):	210			
Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture (lecture)	2	-	-	-
Exercise (exercise)	2	-	Successful completion of the weekly exercises	-
Frequency:	Once a year (winter semester)			
Prerequisites for participating in the module:	None			
Department offering the module:	Linguistics			

BM2: Machine Learning and Data Analysis		Total Credits: 9 CP (Credit Points)
Module type (compulsory/ elective module)	Compulsory	

Module content and learning outcomes:	*Intended learning outcomes* Students are able to analyze data analysis and modeling problems, map them onto machine learning paradigms and Bayesian statistics, implement solutions, for example in Python, and define the quality of the inferred models using suitable evaluation protocols. *Syllabus* Types of modeling problems and learning methods, basics of Bayesian statistics and empirical inference, linear classification and regression models, linear mixed models, generalized (mixed) linear models, kernel methods, model evaluation, implementation of data analysis methods, e.g. in Python.
(Sub) module exam(s) (number, type, scope):	Oral exam, 30 minutes
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Intelligent Data Analysis (lecture)	2	-	-	-
Intelligent Data Analysis (exercise)	2	-	Completing 70% of the exercises and completing a project task	-

Frequency:	Once a year (summer semester)
Prerequisites for participating in the module:	None
Department offering the module:	Computer Science

BM3: Advanced Problem Solving Techniques	Total Credits: 9 CP (Credit Points)
Module type (compulsory/ elective module)	Compulsory

Module content and learning outcomes:	*Intended learning outcomes* Students are able to define and interpret special aspects, limits, terminologies, and doctrines in the field of declarative problem solving. Their knowledge and comprehension forms the basis for developing and/ or applying independent and research-oriented ideas in declarative problem solving. Students have a broad, detailed, and critical understanding of state-of-the-art knowledge in selected special areas of declarative problem solving. Students are able to apply their knowledge and comprehension as well as their problem-solving skills in new and unfamiliar situations that have a wider or multidisciplinary connection to declarative problem-solving. die in einem breiteren oder multidisziplinären Zusammenhang auf dem Gebiet des Deklarativen Problemlösens stehen. *Syllabus* The course deals with the basics, algorithms, systems, and application of declarative problem-solving methods. Declarative problem-solving methods use general problem-solving methods for automatically solving (mostly combinatorial) problems. This includes design, diagnosis, action and hourly planning, configuration, and much more. In contrast to traditional programming, no programs are created for solving the problems, but only for the (formal) modeling of initial problems. Current problem solving systems are able to solve problems with several million variables. The resulting systems are now used in the industrial sector but also in the natural sciences and linguistics.
(Sub) module exam(s) (number, type, scope):	Written exam, 90 minutes
Self-study time (hours):	180

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Lecture (lecture)	2	-	-	-
Exercise (exercise)	2	-	-	-
Internship (internship)	1	oral consultation on attendance certificate (15 min.)	-	-
Project (project)	2	Documentation (5 pages)	-	-

Frequency:	Once a year (winter semester)
Prerequisites for participating in the module:	None
Department offering the module:	Computer Science

FM1: Foundations of Mathematics	Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module

Module content and learning outcomes:	*Intended learning outcomes:* Students have the necessary background knowledge in mathematics to successfully complete the basic modules of the program. They are able to organize themselves to acquire this knowledge independently and orally present subject matters and connections. *Syllabus:* Analysis: limits, functions, differential calculus, calculating maxima and minima, integral calculus, integration of rational functions, indefinite integrals, functions of multiple variables, partial differentiation, multidimensional integrals. Linear algebra: systems of linear equations, Gaussian algorithm, determinants, matrices and vectors, scalar and vector products, straight lines and planes, differentiation of vector-valued functions. The content is conveyed through relevant online video lectures, e.g. from Coursera or MIT OpenCourseWare.
(Sub) module exam(s) (number, type, scope):	Oral examination (20 min.)
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Video lecture (lecture)	-	-	-	-
Exercise (exercise)	2	-	Successful completion of the exercises	-

Frequency:	Once a year (winter semester)
Prerequisites for participating in the module:	Decision of the Examining Board pursuant to § 5(1)
Department offering the module:	Linguistics

FM2: Foundations of Computer Science	Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module

Module content and learning outcome:	*Intended learning outcomes:* Students have the necessary background knowledge in computer science to successfully complete the basic modules of the program. They are able to organize themselves to acquire this knowledge independently and orally present subject matters and connections. *Syllabus:* Algorithms and data structures: growth of functions and O-notation, divide-and-conquer, sorting and searching, elementary data structures, dynamic programming, greedy algorithms, elementary graph algorithms Formal languages: Chomsky hierarchy; regular languages and finite-state automata, context-free languages and push-down automata. finite-state transducer; Turing machines Theoretical foundations: computability, halting problem, nondeterminism, recursion, inductive definitions (lists, trees). The content is conveyed through relevant online video lectures, e.g. from Coursera or MIT OpenCourseWare. .
(Sub) module exam(s) (number, type, scope):	Oral examination (20 min.)
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Video lecture (lecture)	-	-	-	-
Exercise (exercise)	2	-	Successful completion of the exercises	-

Frequency:	Once a year (winter semester)
Prerequisites for participating in the module:	Decision of the Examining Board pursuant to § 5(1)
Department offering the module:	Computer Science

FM3: Foundations of Linguistics	Total Credits: 6 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module

Module content and learning outcomes:	*Intended learning outcomes:* Students have the necessary background knowledge in linguistics to successfully complete the basic modules of the program. They are able to organize themselves to acquire this knowledge independently and orally present subject matters and connections. *Syllabus:* Theoretical foundations of: syntax, semantics, phonology, and psycholinguistics: structure of words, phrase structure, syntactic dependencies, word order and syntactic relations; foundations of Montague semantics, compositionality, scope, conventional and conversational implicature, Gricean maxims, speech sounds, phonological representations and constraints, theories of word and sentence processing, dialogue and discourse processing, language acquisition. The content is conveyed through relevant online video lectures, e.g. from Coursera or MIT OpenCourseWare.
(Sub) module exam(s) (number, type, scope):	Oral examination (20 min.)
Self-study time (hours):	150

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Video-Lecture (lecture)	-	-	-	-
Exercise (exercise)	2	-	Successful completion of the exercises	-

Frequency:	Once a year (winter semester)
Prerequisites for participating in the module:	Decision of the Examining Board pursuant to § 5(1)
Department offering the module:	Linguistics

IM1: Individual Research Module	Total Credits: 15 CP (Credit Points)
Module type (compulsory/ elective module)	Compulsory
Module content and learning outcomes:	*Syllabus:* *Intended learning outcomes:* Students prepare their own research project which they define together with a lecturer and select on the basis of current research topics. They present their results at the institute and document them in writing. *Intended learning outcomes:* - Students have in-depth and detailed knowledge of their research topic. They are able to formulate their own research questions, master the methods of their subject and work independently on their research questions. - Students are able to present their research results to experts at a public meeting and account for their research questions.

(Sub) module exam(s) (number, type, scope):	For course-related (sub)module exam(s) see below			
Self-study time (hours):	420			
Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Internship (internship)	2	-	-	Portfolio exam consisting of a term paper (approx. 30 pages) and a presentation (approx. 20 minutes) or poster presentation on the project topic
Frequency:	Each semester			
Prerequisites for participating in the module:	None			
Departments offering the module:	Linguistics (50%) Computer Science (50%)			

PM1: Project in Computational Linguistics	Total Credits: 12 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module

Module content and learning outcomes:	*Syllabus:* Students first work on a specific topic of current research in computational linguistics. They read up on the specific topic and discuss question in the seminar. On this basis, teams of students then define their own research, experimental, or development projects with a clearly defined content. They work on these projects and ultimately present their results. When selecting the subject areas, the lecturers will focus on research topics in current literature. *Intended learning outcomes:* - Students have become acquainted with a specific area in detail and know the current state of research. They are able to correlate the content of the state of research and, by critically assessing it, develop their own research questions. This enables them to apply these skills to other topics in their later work. - Students are able to independently define a realistic topic for their projects. They are able to select suitable subject-specific methods and apply them effectively to the project. To do so, they are able to obtain the necessary resources (programs, data sets, grammars, etc.) and adapt them for their purposes or develop them themselves. - Students are able to plan and organize a defined research project and assess its feasibility and the required resources. They are proficient in taking responsibility for the success of the project, working in a team, and managing sub-projects. They are able to organize their own and their team's working time and work towards a deadline. - Students are able to present and account for their research question. They are able to present the project results verbally and in writing according to the guidelines of good scientific communication. They are trained to communicate effectively within their team about approaches, distribution of work, and possible conflicts and to effectively communicate these aspects and to other teams as well as to give constructive feedback.
(Sub) module exam(s) (number, type, scope):	For course-related (sub)module exam(s) see below
Self-study time (hours):	330

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Seminar (seminar)	2	-	-	Portfolio exam consisting of project report (approx. 20 pages) and project presentation (20 minutes)

Frequency:	Once a year (usually in the summer semester)
Prerequisites for participating in the module:	None
Department offering the module:	Linguistics

<table>
<tr><th colspan="2">PM2: Project in Machine Learning</th><th colspan="3">Total Credits:
12 CP (Credit Points)</th></tr>
<tr><td>Module type (compulsory/ elective module)</td><td colspan="4">Elective module</td></tr>
<tr><td>Module content and learning outcomes:</td><td colspan="4">Intended learning outcomes:
- Students have become acquainted with a specific area in detail and know the current state of research. They are able to correlate the content of the state of research and, by critically assessing it, develop their own research questions. This enables them to apply these skills to other topics in their later work.
- Students are able to independently define a realistic topic for their projects. They are able to select suitable subject-specific methods and apply them effectively to the project. To do so, they are able to obtain the necessary resources (programs, data sets, grammars, etc.) and adapt them for their purposes or develop them themselves.
- Students are able to plan and organize a defined research project and assess its feasibility and the required resources. They are proficient in taking responsibility for the success of the project, working in a team, and managing sub-projects. They are able to organize their own and their team’s working time and work towards a deadline.
- Students are able to present and account for their research question. They are able to present the project results verbally and in writing according to the guidelines of good scientific communication. They are trained to communicate effectively within their team about approaches, distribution of work, and possible conflicts and to effectively communicate these aspects and to other teams as well as to give constructive feedback.

Syllabus:
Students first work on a specific topic of current research in machine learning. They read up on the specific topic and discuss question in the seminar. On this basis, teams of students then define their own research, experimental, or development projects with a clearly defined content. They work on these projects and ultimately present their results.
When selecting the subject areas, the lecturers will focus on research topics in current literature.</td></tr>
<tr><td>(Sub) module exam(s) (number, type, scope):</td><td colspan="4">For course-related (sub)module exam(s) see below</td></tr>
<tr><td>Self-study time (hours):</td><td colspan="4">330</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td rowspan="2">Courses (teaching format)</td><td rowspan="2">Contact hours (hours per week)</td><td colspan="2">Exam prerequisites (number, type, scope)</td><td rowspan="2">Course-related (sub) module exam(s) (number, type, scope)</td></tr>
<tr><td>For completing the module</td><td>For admission to module exam</td></tr>
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Seminar (Seminar)	2	-	-	Portfolio exam consisting of project report (approx. 20 pages) and project presentation (20 minutes)
Frequency:		Once a year (usually in the winter semester)		
Prerequisites for participating in the module:		None		
Departments offering the module:		Computer Science (50 %) Linguistics (50 %)		

PM3: Project in Computational Intelligence	Total Credits: 12 CP (Credit Points)
Module type (compulsory/ elective module)	Elective module
Module content and learning outcomes:	*Intended learning outcomes:* - Students have become acquainted with a specific area in detail and know the current state of research. They are able to correlate the content of the state of research and, by critically assessing it, develop their own research questions. This enables them to apply these skills to other topics in their later work. - Students are able to independently define a realistic topic for their projects. They are able to select suitable subject-specific methods and apply them effectively to the project. To do so, they are able to obtain the necessary resources (programs, data sets, grammars, etc.) and adapt them for their purposes or develop them themselves. - Students are able to plan and organize a defined research project and assess its feasibility and the required resources. They are proficient in taking responsibility for the success of the project, working in a team, and managing sub-projects. They are able to organize their own and their team's working time and work towards a deadline. - Students are able to present and account for their research question. They are able to present the project results verbally and in writing according to the guidelines of good scientific communication. They are trained to communicate effectively within their team about approaches, distribution of work, and possible conflicts and to effectively communicate these aspects and to other teams as well as to give constructive feedback. *Syllabus:* Students first work on a specific topic of current research in computational intelligence. They read up on the specific topic and discuss question in the seminar. On this basis, teams of students then define their own research, experimental, or development projects with a clearly defined content. They work on these projects and ultimately present their results. When selecting the subject areas, the lecturers will focus on research topics in current literature.
(Sub) module exam(s) (number, type, scope):	For course-related (sub)module exam(s) see below
Self-study time (hours):	330

Courses (teaching format)	Contact hours (hours per week)	Exam prerequisites (number, type, scope)		Course-related (sub) module exam(s) (number, type, scope)
		For completing the module	For admission to module exam	
Seminar (seminar)	2	-	-	Portfolio exam consisting of project report (approx. 20 pages) and project presentation (20 minutes)

Frequency:	Once a year (usually in the summer semester)
Prerequisites for participating in the module:	None
Department offering the module:	Computer Science