Module Description/Syllabus

BE IM HM CfPS

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Module	Natural Language Processing and Text Mining	Module-Number	
Course Title	Natural Language Processing and Text Mining	Overall grade weighting (in %)	2,4
Recommended alternative modules or courses			
Course of Studies	Data Science Management		
Examination No. (SuP)	100696	**valid SER**	20202 v. 2.11.2021
Mode of Study	☒ full-time ☐ part-time		
Study Cycle EQF-Level	◉ Bachelor ○ Master		
Frequency	◉ winter term ○ summer term ○ each semester		
Language Competence Level and Course code SAP ☐			
Responsible for the module	Prof. Dr. Philipp Brune		
Lecturer/s			
Typ of course	◉ compulsory ○ optional		
Mode of delivery	Seminar		
Language of instruction	◉ English ○ German	**Level of course**	5th semester
Teaching Methods	Blended learning with flipped classroom	**Duration**	1 semester
	Practical exercises		
	Project based learning		

Work parameters

HNU-Workload-Calculator

contact hours in lecture form	exercises (hours)	self-studies (hours)	total (hours)
40		110	150
eLearning (hours)	**examination pre-paration (hours)**	**Transfer (hours)**	**Units ("UE")**
			200

Number of participants min./max.			ECTS-Points		Volume	(hours per semester week)	
10	/	40	05			04	

Use for other studies	Information Management Automotive Digital Enterprise Management (as an elective)

Prerequisites/ Required competencies	Knowledge of programming with Java and Python, SQL and databases, AI and Big Data fundamentals, mathematical fundamentals corresponding to undergraduate courses.
Learning Outcome **1) Knowledge** **2) Skills** **3) Responsibility and autonomy** Description eight EQF Levels and Learning Outcome (1-3)	Students after participation will be able to, 1) Subject-methodological competences: - know and understand the historical development and current trends in Natural Language Processing (NLP). - critically analyze and classify the historical development and current trends in NLP. - know and understand the relevant procedures and concepts of NLP, Text Mining and Deep NLP and their mathematical foundations. - apply the relevant methods and concepts of NLP, Text Mining and Deep NLP in practice. - solve own smaller NLP problems independently. - read and understand current literature and first scientific publications on the topic. 2) Personal competences: - work on tasks independently. - deepen their IT and programming skills independently. - work successfully in a team.
Content	In order for students to have the competences described above after this module, the following topics will be covered: - Language modeling with N-gram and word embeddings. - Basics of NLP: Part of speech tagging, lemmatization, named entity recognition - Document classification and topic modeling - Sentiment analysis - Deep natural language processing - Transformer architectures - Automatic text summarization and text generation

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Particular admission requirements **(if applicable)**	
Curriculum semester, in which the student has to be mandatorily registered for the first attempt of examination	9th semester
Assessment method(s)	Written exam, see course catalog
Assessment criteria	
Required reading resources	Eisenstein, Jacob (2019). Introduction to natural language processing. MIT press.
	Hirschle, Jochen (2022). Deep Natural Language Processing: Einstieg in Word Embedding, Sequence-to-Sequence-Modelle und Transformer mit Python. Carl Hanser Verlag.
	Rothman, Denis (2021). Transformers for Natural Language Processing. Packt Publishing Ltd.
	Liddy, Elizabeth D. (2011). Natural language processing for information retrieval. En-cyclopedia of Library and Information Sciences. 3rd. New York: Taylor and Francis, 3864-3873.
Additional (module) information	
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