STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Applications of information technologies**		Code **1010331571010334978**
Field of study **Information Engineering**	Profile of study (general academic, practical) **(brak)**	Year /Semester **4 / 7**
Elective path/specialty **Information Technologies**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **30** Classes: **-** Laboratory: **-** Project/seminars: **15**		No. of credits **4**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **100 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W04: mStudent has organized knowledge with theoretical foundations of basic program constructions, algorithm implementations, paradigms and programming styles, software verification methods, formal languages, compilers, platforms. K_W08: possesses structured and theoretically founded knowledge of databases and data warehouses; K_W12: K_W12: has ordered and methodological knowledge of software engineering
2	**Skills**	K_U02: is able to work independently and in a team, is able to estimate the time needed for the commissioned tasks, able to develop and implement a schedule of work to ensure deadlines, K_U03: is able to develop documentation of engineering tasks and prepare a text containing a discussion of the results of this task realizacji tego zadania
3	**Social competencies**	K_K04: is aware of responsibility for his/her own work and a willingness to comply with the principles of teamwork and shared responsibility

Assumptions and objectives of the course:

To acquaint students with the algorithms and methods of extracting information from text. Practical application of lead extraction systems using correlation words: Indri, Terrier. Practical analysis of the results obtained with the construction of systems based on semantic vocabularies / ontologies: Yago2, Reverb, Nell. Storage, access and processing so. NoSQ databases.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has organized knowledge with theoretical foundations of basic program constructions, algorithm implementations, paradigms and programming styles, software verification methods, formal languages, compilers, platforms. - [K_W05]
2. Student is familiarized with state of the art and current trends in computer science. - [K_W19]
3. Student knows common IT engineering technology. - [K_W18]

Skills:

1. Student is able to use software platforms and environments for simple programs encoding, running and testing in imperative, object-oriented and declarative programming languages - [K_U10]
2. Student is able to prepare requirements, to create object model and to evaluate uncomplicated IT system, including system functions and relations between system elements. - [K_U16]
3. Student is able to choose and to implement proper technologies - [K_U22]

Social competencies:

1. understands the need and knows the opportunity of continuous training (second-and third-degree, postgraduate courses) ? improvement of language, professional, personal and social skills - [K_K01]

Assessment methods of study outcomes

Lecture: written examination checking the knowledge of basic algorithms for information extraction and semantic search.

Project: demonstration of the application made ??by the leading semantic search systems, Terrier.Wykład: egzamin pisemny sprawdzający znajomość podstawowych algorytmów ekstrakcji informacji i wyszukiwania semantycznego.

Projekt: pokaz działania aplikacji zrealizowanych przy pomocy wiodących semantycznych systemów wyszukiwawczych, Terrier.

Course description

Lecture. Semantic processing of information. Algorithms and methods for extracting information from text. Types of information: structured and unstructured semistrukturalna. Method of LSA (Latent Semantic Analysis) and SVM. Natural language processing methods. Measures of the quality of the extraction.

Tools that use correlations of words: Indri, Terrier. Systems based on the construction of semantic vocabularies/ontologies: Yago2, Reverb, Nell. Search by concepts (focused crawling). Tools: GATE, OmniFind. Search-engine Lucene. Semantic extraction pf legal information (e-discovery). The IBM Watson.

Project. Application of LSA, the extended semantics. Projects using Indri, Terrier: query language and the use of quality function. Examples of different tokenizers. The analysis of the results for extraction quality measurement. Search of terrorist content on the Internet.

Basic bibliography:

1. 1.Christopher D. Manning, Prabhakar Raghavan, Hinrich Schütze An Introduction to Information Retrieval, Cambridge UP, 2009

2. W. Bruce Croft, Donald Metzler, and Trevor Strohman, Search Engines: Information Retrieval in Practice Addison Wesley; 1 edition (2009)

3. Articles referring to Yago2, Reverb, Nell, Terrier

Additional bibliography:

1. Dokumentation: Gate, Terrier i Omnifind

Result of average student's workload

Activity	Time (working hours)
1. Lecture	30
2. Independent work on the subject of the lecture.	25
3. Preparation to project	15
4. Doing project	15
5. Exam preparation	15

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	45	2
Practical activities	30	1