STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Recommender systems		**1010334591010337135**

Field of study	Profile of study (general academic, practical)	Year /Semester
Information Engineering	**(brak)**	**5 / 9**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Information Technologies	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**part-time**

No. of hours				No. of credits
Lecture: **8**	Classes: **-**	Laboratory: **-**	Project/seminars: **8**	**3**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W07: Student has organized knowledge with theoretical foundations of computer networks. K_W05: 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_W08: Student has organized knowledge with theoretical foundations of databases and data warehouses.
2	**Skills**	K_U01: Student is able to acquire information from literature, data bases and other sources; student is able to integrate acquired information, to interpret it, to draw conclusions and to formulate and justify judgments. K_U03: Student is able to create engineer work documentation and to prepare text with the work result discussion.
3	**Social competencies**	K_K02: Student understands and is aware of the importance of nontechnical issues related to computer engineer activity. Student understands the responsibility associated to his engineering decisions.

Assumptions and objectives of the course:

The primary objective of the course is to make students familiar with the key technologies used in modern recommendation systems, such as collaborative filtering, hybrid recommendation and integration of recommendation with semantic search. A special emphasis is put on methods for processing data represented in the multi-dimensional vector spaces. An important aim is to introduce students to the issues of recommendation systems, which are crucial from the perspective of a commercially successful implementation of recommendation systems, including SaaS (Software as a Service) components integrated with e-commerce systems.

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

Knowledge:

1. Student has theoretical and practical knowledge on artificial intelligence and on expert and multi-agent systems. - [K_W09]
2. Student has organized knowledge with theoretical foundations of Internet technologies. - [K_W11]
3. Student has organized knowledge with theoretical foundations of teleinformatics, protocols and services in telecommunication networks. - [K_W15]

Skills:

1. Student is able to create engineer work documentation and to prepare text with the work result discussion. - [K_U03]
2. Student is able to carry out work with web sites and Internet services. - [K_U15]
3. Student is able to design and develop a simple expert or multi-agent system. - [K_U13]

Social competencies:

1. Student understands and is aware of the importance of nontechnical issues related to computer engineer activity. Student understands the responsibility associated to his engineering decisions. - [K_K02]

Assessment methods of study outcomes

Evaluation of knowledge acquired from the lecture: a written exam.

Evaluation of project tasks: the average of three ratings: quality of the application, the documentation and the demonstration/presentation.

Course description

The key issues of the course are:

- collaborative filtering
- hybrid recommendation
- session context modeling
- natural language processing applied to large sets of documents
- computational aspects of corpus linguistics
- textual data mining methods with particular emphasis on Latent Semantic Analysis and related methods as well as leading reflective methods (in particular, Reflective Random Indexing)
- semantic search (based on vector space model)
- integration of recommendation systems and semantic search systems,
- commercial recommendation systems,
- recommendation systems used as components of e-commerce systems, integration with CMS (Content Management Systems) for e-commerce
- software platforms used in recommender systems.

The student projects focus on the use of publicly available test data sets (e.g. MovieLens, Jester), software components developed in PP research projects and on recommendation systems working as components of e-commerce systems in a SaaS model (Software as a Service).

Basic bibliography:

1. Witold Abramowicz, Filtrowanie informacji, Wydawnictwo Akademii Ekonomicznej w Poznaniu, Poznań 2008

2. Manning, C. D., Raghavan, P., and Schtze, H.: Introduction to Information Retrieval, Cambridge University Press, (2008)

3. Jonathan Lee Herlocker, Understanding and Improving Automated Collaborative Filtering Systems, Ph.D Dissertation, University of Minnesota, September 2000

Additional bibliography:

1. Gediminas Adomavicius, Alexander Tuzhilin, Toward the Next Generation of Recommender Systems: A Survey of the State?of?the?Art and Possible Extensions, IEEE Transactions on Knowledge and Data Engineering, 2005, 734 ? 749

2. Burke, R.: Hybrid Web Recommender Systems, in Brusilovsky, P., Kobsa, A., Ne- jdl, W. (eds.). The Adaptive Web: Methods and Strategies of Web Personalization., LNCS, Berlin-Heidelberg, Springer, Vol. 4321, 377-408, (2007)

3. Burke, R., Hybrid Recommender Systems: Survey and Experiments, User Modeling and User-Adapted Interaction, Vol. 12, Nr 4, 331-370, (2002)

Result of average student's workload

Activity	Time (working hours)
1. Lectures	15
2. Project	15
3. Consultations and exam	5
4. Project presentation preparation	25
5. Project report preparation and exam preparation	20

Student's workload

Source of workload	hours	ECTS
Total workload	150	6
Contact hours	75	3
Practical activities	75	3