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**Aktuelle Modulbeschreibung**

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| **Module Number:** | **11881** |
| **Module Title:** | **Foundations of Data Mining** |
|  | Grundlagen des Data Mining |
| **Department:** | Faculty 1 - Mathematics, Computer Science, Physics, Electrical Engineering and Information Technology |
| **Responsible Staff Member:** | * Prof. Dr.-Ing. Schmitt, Ingo |
| **Language of Teaching / Examination:** | English |
| **Duration:** | 1 semester |
| **Frequency of Offer:** | Each winter semester even year |
| **Credits:** | 6 |
| **Learning Outcome:** | Acquaintance with the statistical and learning-theoretical foundations of knowledge extraction from large data sets; knowledge of specific notions and of mathematical background in order to understand current publications and software concerning the field; ability of transfer to concrete problems; knowledge of algorithms and their usage. |
| **Contents:** | * Foundation of statistics * Clustering (partition-based, density-based, hierarchical, ...) * Classification (decision trees, support vector machines, ...) * Association rules (frequent itemsets) * further data mining approaches   Acquired knowledge will be applied within a project. |
| **Recommended Prerequisites:** | Knowledge of the content of the modules   * 11112: Mathematics IT-1 (Discrete Mathematics) * 11113: Mathematics IT-2 (Linear Algebra) |
| **Mandatory Prerequisites:** | No successful participation in module *12351 Grundlagen des Data Mining*. |
| **Forms of Teaching and Proportion:** | * Lecture / 2 Hours per Week per Semester * Exercise / 1 Hours per Week per Semester * Practical training / 1 Hours per Week per Semester * Self organised studies / 120 Hours |
| **Teaching Materials and Literature:** | * James, Gareth; Witten, Daniela; Hastie, Trevor; Tibshirani, Robert: An Introduction to Statistical Learning with Applications in R. Springer, New York 2013. * Aloaydin, Ethem: Machine Learning. The MIT Press, Massachusetts Institute of Technology, 2004. * Mitchell, Tom M.: Machine Learning. McGraw-Hill, 1997. |
| **Module Examination:** | Prerequisite + Final Module Examination (MAP) |
| **Assessment Mode for Module Examination:** | **Prerequisite:**   * Successful completion of project exercises in the course   **Final module examination:**   * Written examination, 90 min. **OR** * Oral examination, 30-45 min. (with small number of participants)   In the first lecture it will be annunced, if the examination will offered in written or oral form. |
| **Evaluation of Module Examination:** | Performance Verification – graded |
| **Limited Number of Participants:** | None |
| **Part of the Study Programme:** | * Abschluss im Ausland / Betriebswirtschaftslehre / keine Prüfungsordnung * Abschluss im Ausland / Cyber Security / keine Prüfungsordnung * M.Sc. / Cyber Security (research-oriented profile) / Prüfungsordnung 2017 * B.Sc. / Informatik (research-oriented profile) / Prüfungsordnung 2008 - 1. SÄ 2017 * M.Sc. / Informations- und Medientechnik (research-oriented profile) / Prüfungsordnung 2017 * Abschluss im Ausland / Power Engineering / keine Prüfungsordnung |
| **Remarks:** | * Study programme Computer Science B. Sc.: Compulsory elective module in complex "Foundations of Computer Science" (level 300). * Study programme Information and Media Technology M. Sc.: Compulsory elective module in complex "Fundamental Methods" or complex "Multimedia Systems".. * Study programme eBusiness M. Sc.: Compulsory elective module in main focus "Application and Operation of eBusiness Systems". * Study programme Cyber Security M.Sc.: Compulsory elective module in complex "Computer Science".   If there is no need that the module is taught in English, alternatively the german version 12351 "Grundlagen des Data Mining" may be offered instead.   Module 11881 "Foundations of Data Mining" and 12351 "Grundlagen des Data Mining"  can not be combined. |
| **Module Components:** | * Lecture Foundations of Data Mining * Accompanying exercise with laboratory * Related examination |
| **Components to be offered in the Current Semester:** | * [120230 Lecture Grundlagen des Data Mining / Foundations of Data Mining - 2 Hours per Week per Semester](https://www.b-tu.de/qisserver3/rds?state=verpublish&status=init&vmfile=no&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung&veranstaltung.veranstid=74789) * [120231 Exercise Grundlagen des Data Mining / Foundations of Data Mining - 2 Hours per Week per Semester](https://www.b-tu.de/qisserver3/rds?state=verpublish&status=init&vmfile=no&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung&veranstaltung.veranstid=74804) * [120233 Examination Grundlagen des Data Mining / Foundations of Data Mining](https://www.b-tu.de/qisserver3/rds?state=verpublish&status=init&vmfile=no&moduleCall=webInfo&publishConfFile=webInfo&publishSubDir=veranstaltung&veranstaltung.veranstid=76034) |