Single-Page Module-Recommender Web-Application

Graz University of Technology
Technische Universität München

Overview

- Introduction / Motivation
- Infrastructure
- Recommender Application
  - Module Ranking / Attendance Information
  - Collaborative Filtering for Students
  - Lecturer’s Recommendation
- Conclusion

Introduction

- Lucas Reeh
  - Graz University of Technology
  - CAMPUSonline

- Bachelor Thesis / Erasmus Project
  - Technische Universität München (Munich)

Introduction / Motivation

- Module
  - Collection of Lectures and Exams
- Elective Subjects
  - Assist Students in Selection
- Improve University Curriculum-Offer

Infrastructure (1)

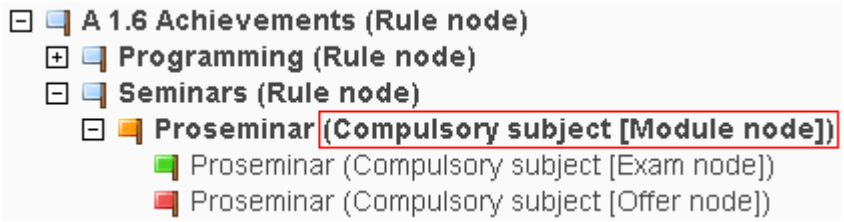
- Campus-Management-System
  - CAMPUSonline
  - All-In-One Database

TUMonline

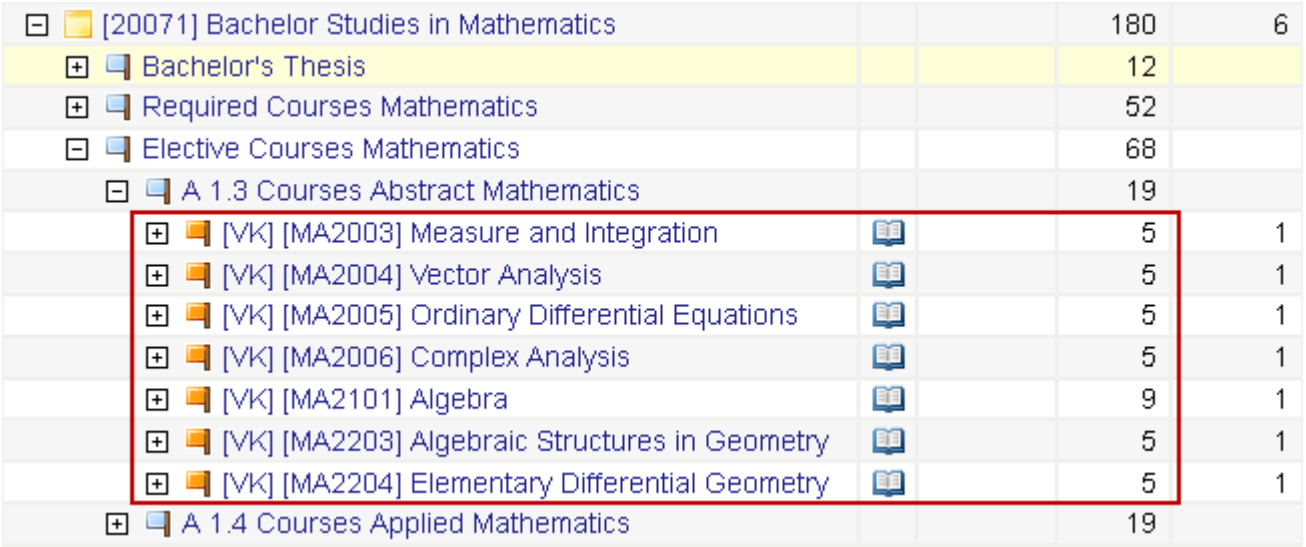
CAMPUSonline

Infrastructure (2)

- Curriculum Data
  - Modules (Nodes)
  - Electives
  - Grades / Progress



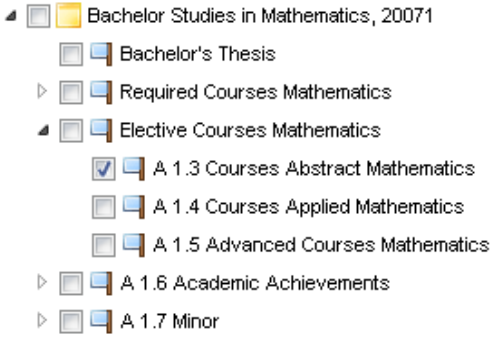
Infrastructure (3)



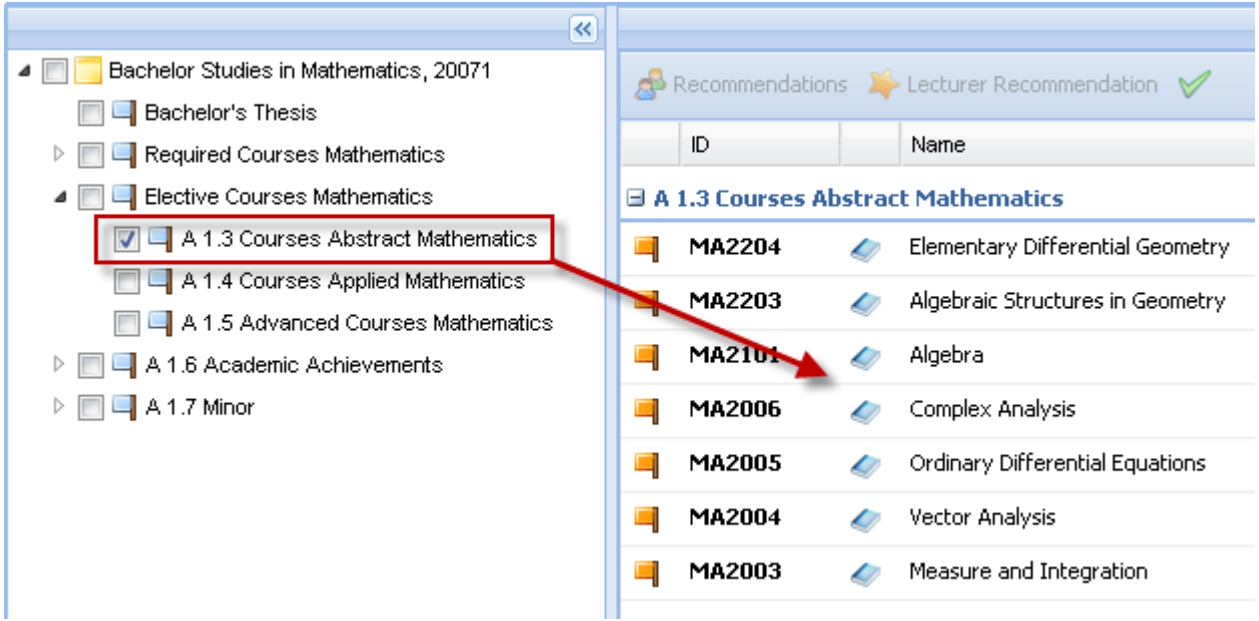
[20071] Bachelor Studies in Mathematics			180	6
Bachelor's Thesis			12	
Required Courses Mathematics			52	
Elective Courses Mathematics			68	
A 1.3 Courses Abstract Mathematics			19	
[VK] [MA2003] Measure and Integration			5	1
[VK] [MA2004] Vector Analysis			5	1
[VK] [MA2005] Ordinary Differential Equations			5	1
[VK] [MA2006] Complex Analysis			5	1
[VK] [MA2101] Algebra			9	1
[VK] [MA2203] Algebraic Structures in Geometry			5	1
[VK] [MA2204] Elementary Differential Geometry			5	1
A 1.4 Courses Applied Mathematics			19	

Infrastructure (4)

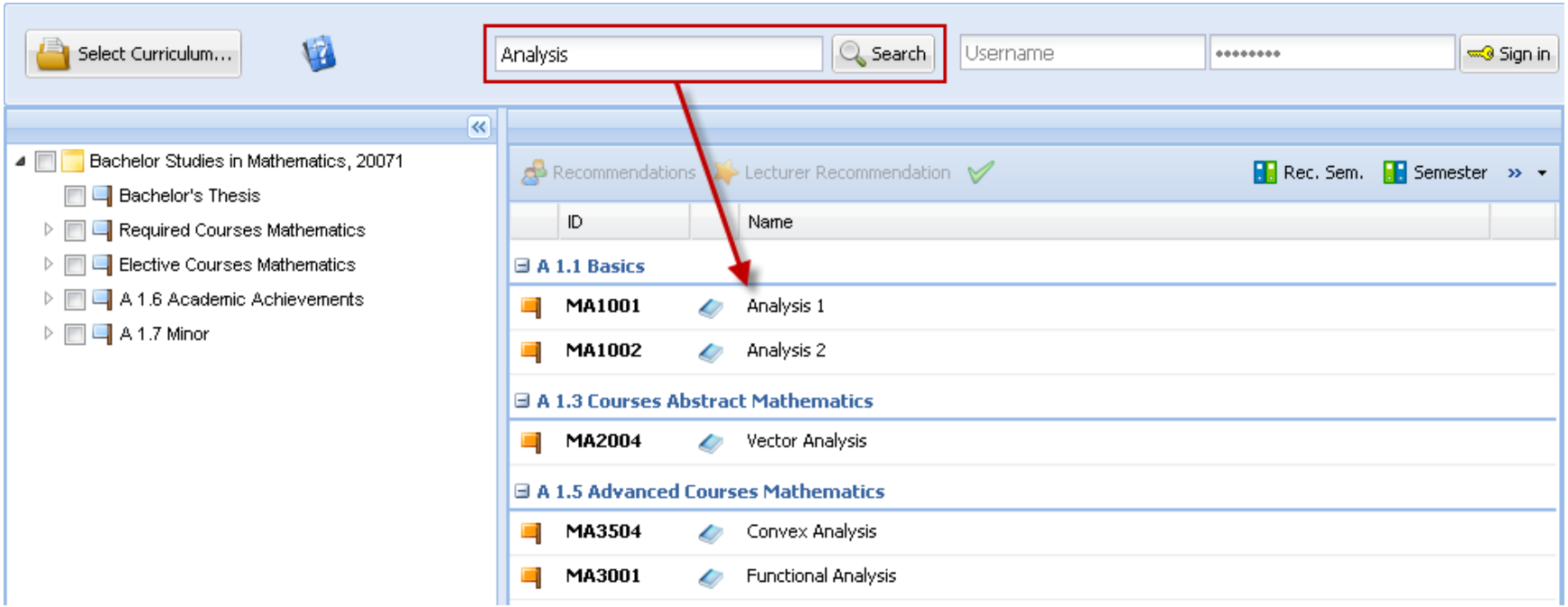
- Web-Application
  - Single-Page
  - Google Web-Toolkit
  - Technical Details (End of Presentation)



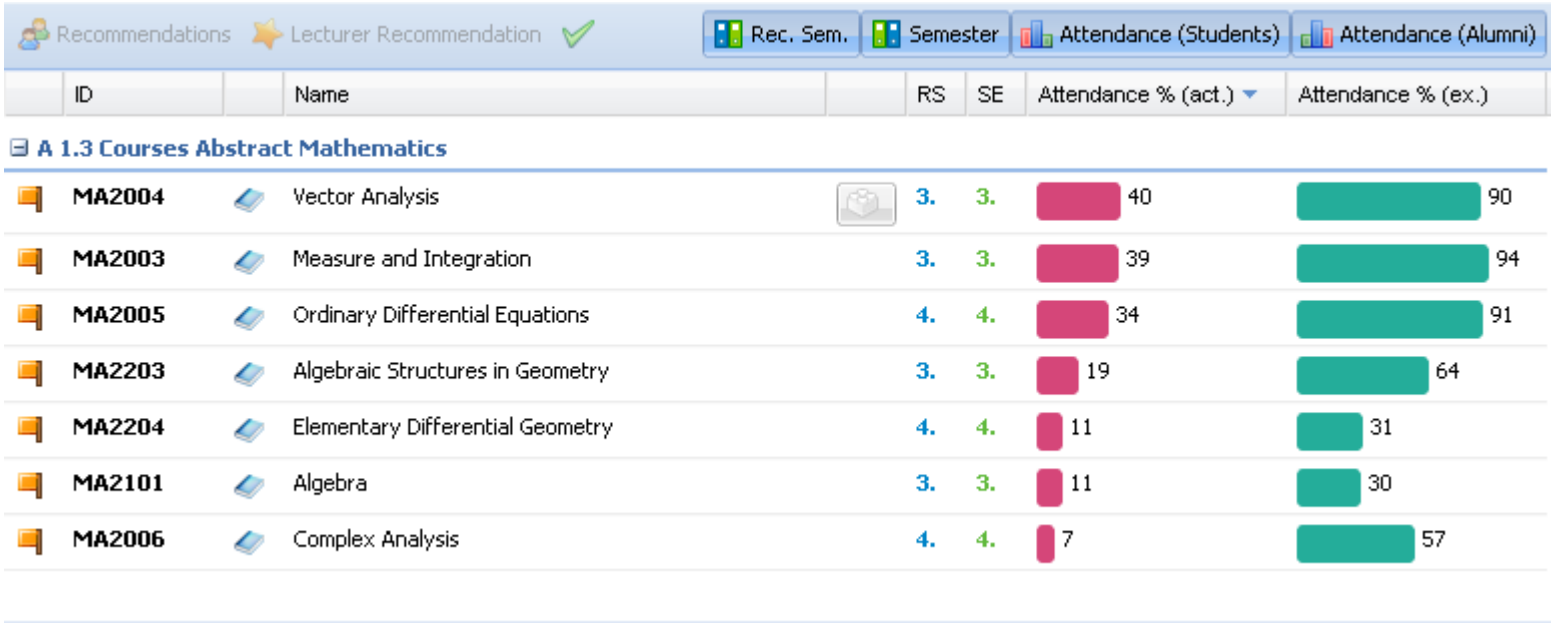
Navigation


Bachelor Studies in Mathematics, 20071
Bachelor's Thesis
Required Courses Mathematics
Elective Courses Mathematics
A 1.3 Courses Abstract Mathematics
A 1.4 Courses Applied Mathematics
A 1.5 Advanced Courses Mathematics
A 1.6 Academic Achievements
A 1.7 Minor
Recommendations
Lecturer Recommendation
ID
Name
A 1.3 Courses Abstract Mathematics
MA2204 Elementary Differential Geometry
MA2203 Algebraic Structures in Geometry
MA2101 Algebra
MA2006 Complex Analysis
MA2005 Ordinary Differential Equations
MA2004 Vector Analysis
MA2003 Measure and Integration

Search


Select Curriculum...
Analysis
Search
Username
Sign in
Bachelor Studies in Mathematics, 20071
Bachelor's Thesis
Required Courses Mathematics
Elective Courses Mathematics
A 1.6 Academic Achievements
A 1.7 Minor
Recommendations
Lecturer Recommendation
Rec. Sem.
Semester
ID
Name
A 1.1 Basics
MA1001
Analysis 1
MA1002
Analysis 2
A 1.3 Courses Abstract Mathematics
MA2004
Vector Analysis
A 1.5 Advanced Courses Mathematics
MA3504
Convex Analysis
MA3001
Functional Analysis

Module Ranking / Attendance Information

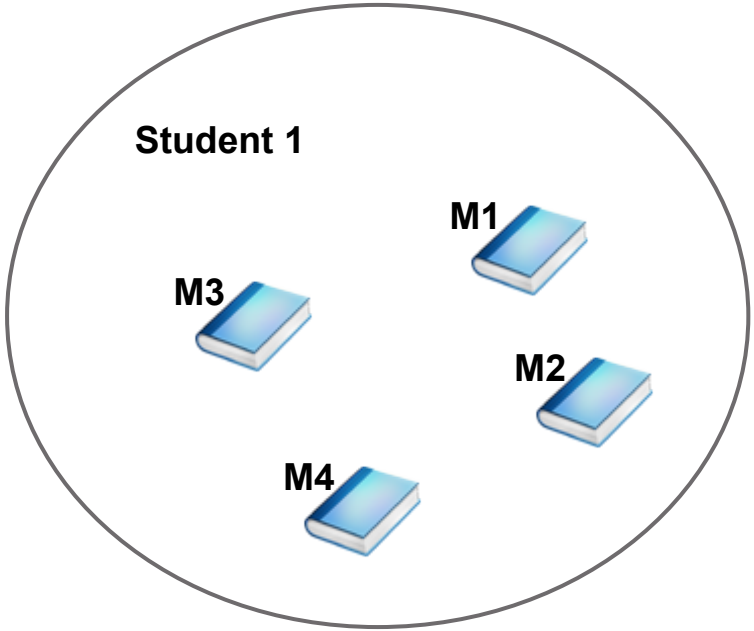


ID	Name	RS	SE	Attendance % (act.)	Attendance % (ex.)
A 1.3 Courses Abstract Mathematics					
MA2004	Vector Analysis	3.	3.	40	90
MA2003	Measure and Integration	3.	3.	39	94
MA2005	Ordinary Differential Equations	4.	4.	34	91
MA2203	Algebraic Structures in Geometry	3.	3.	19	64
MA2204	Elementary Differential Geometry	4.	4.	11	31
MA2101	Algebra	3.	3.	11	30
MA2006	Complex Analysis	4.	4.	7	57

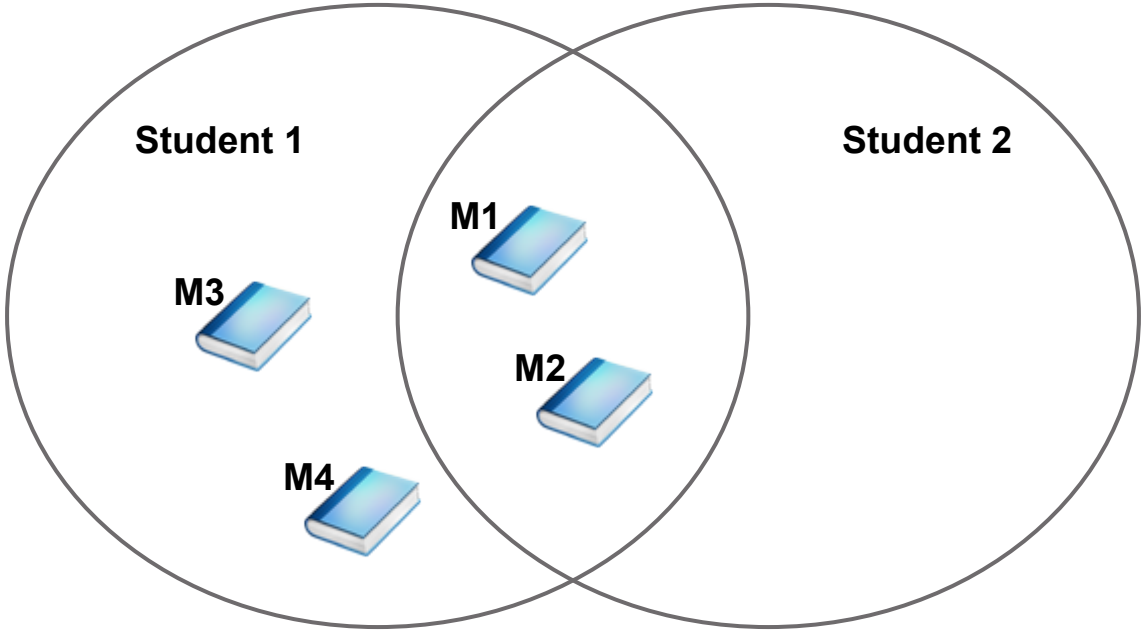
Collaborative Filtering (1)

- Like Amazon
- Only elective modules

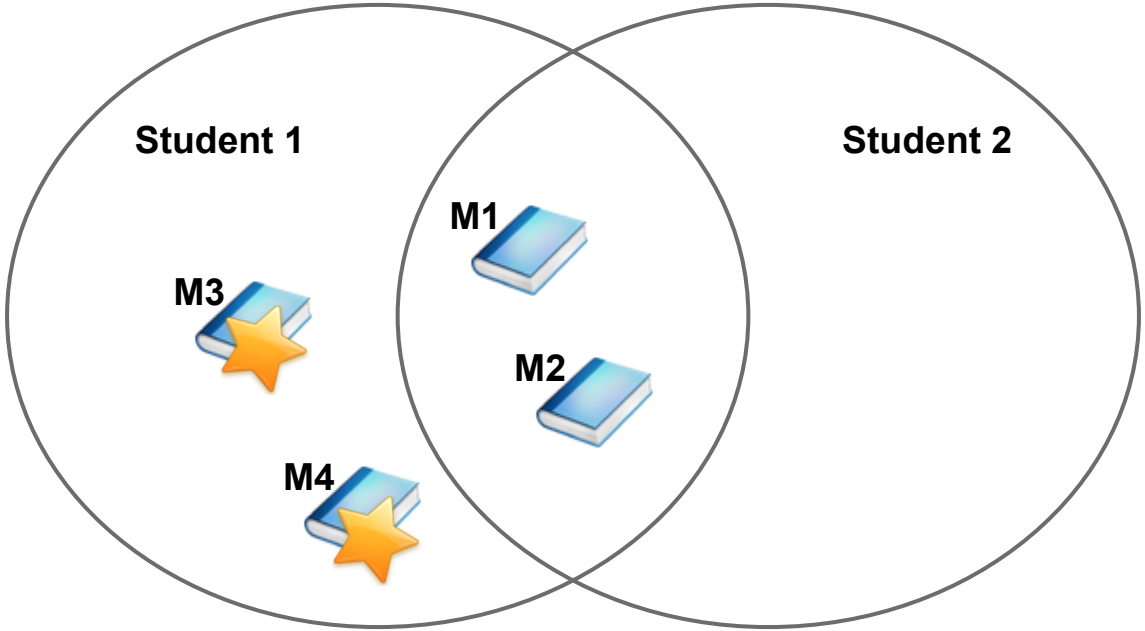
Collaborative Filtering (2)



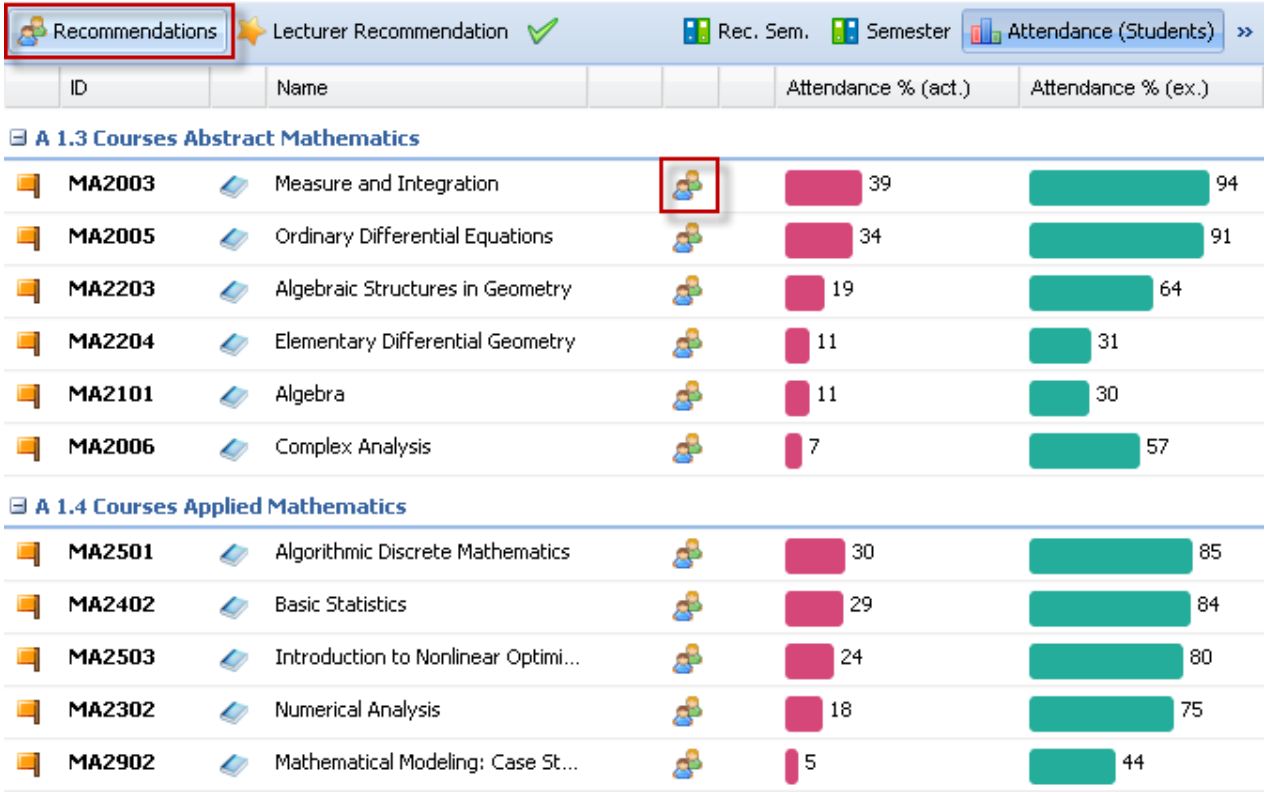
Collaborative Filtering (3)



Collaborative Filtering (4)

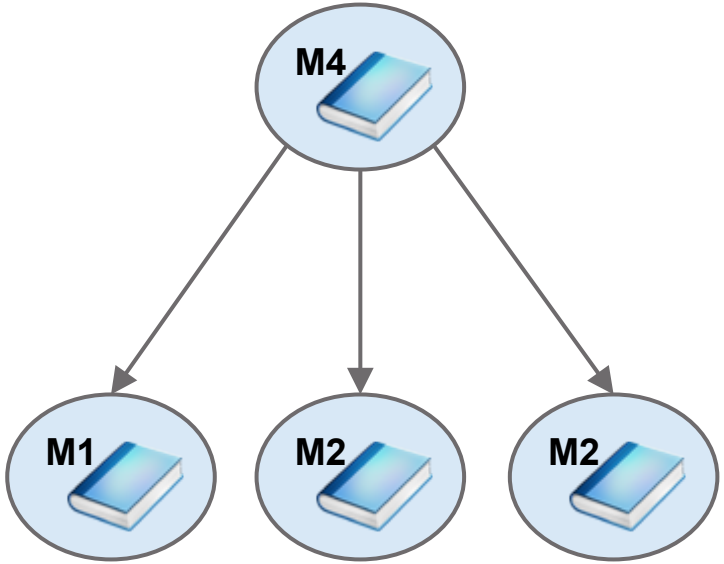


Collaborative Filtering (5)



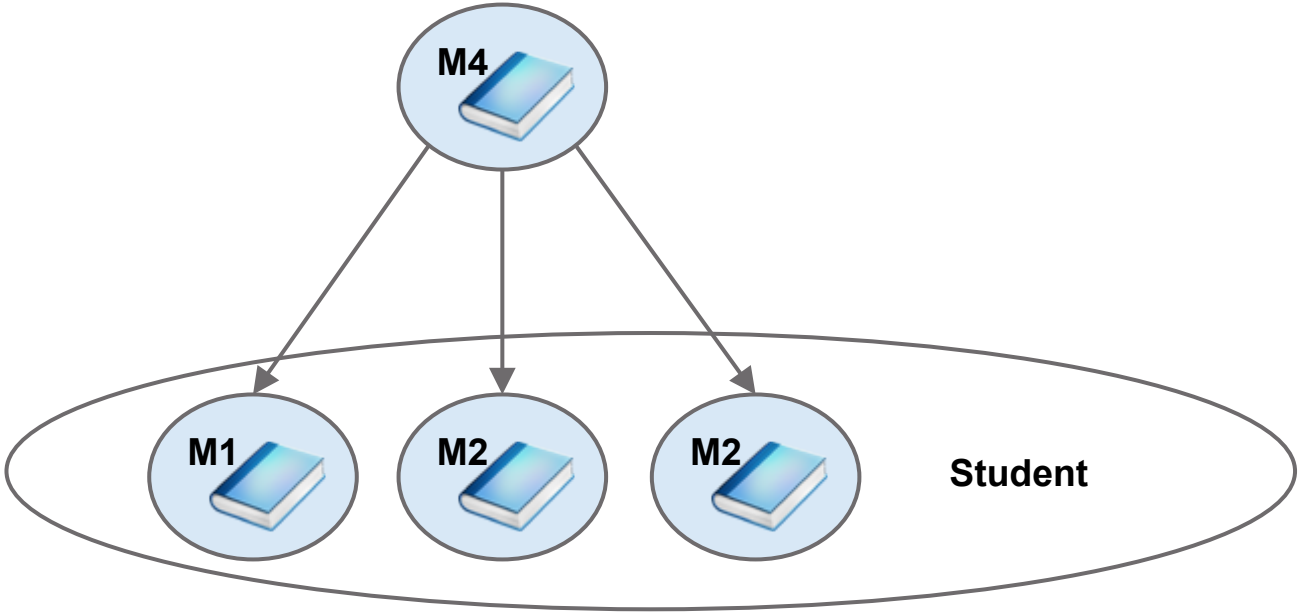
Lecturer’s Recommendation (1)

- Defines Requirements for Modules



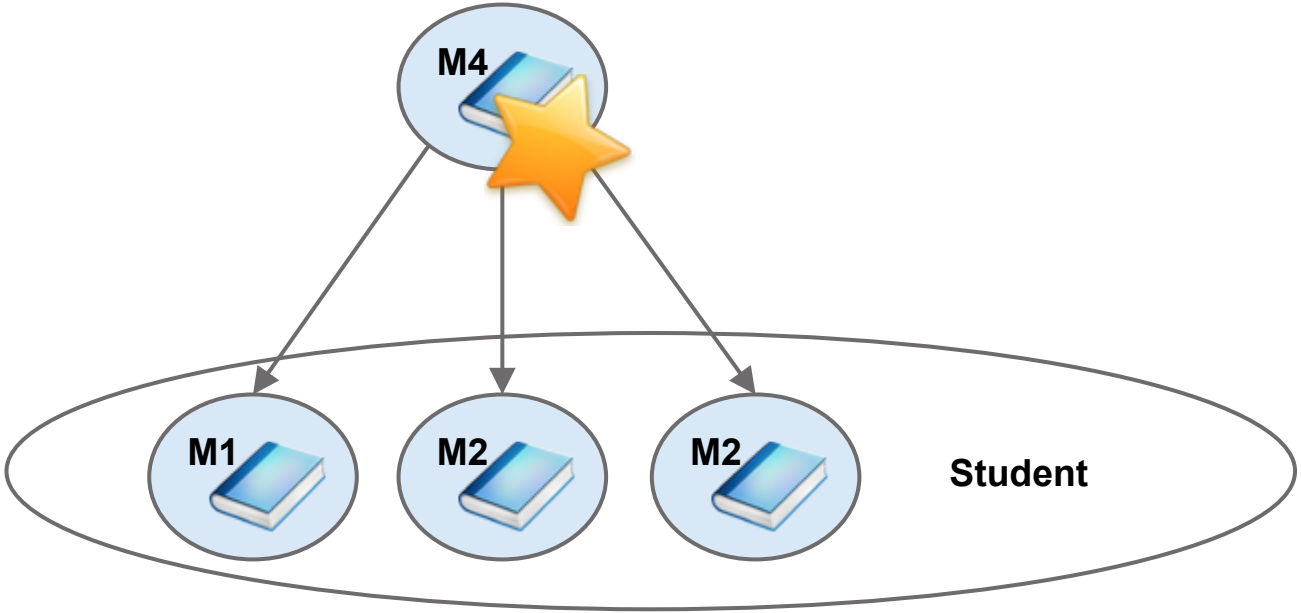
Lecturer’s Recommendation (2)

- Student passed all required Modules

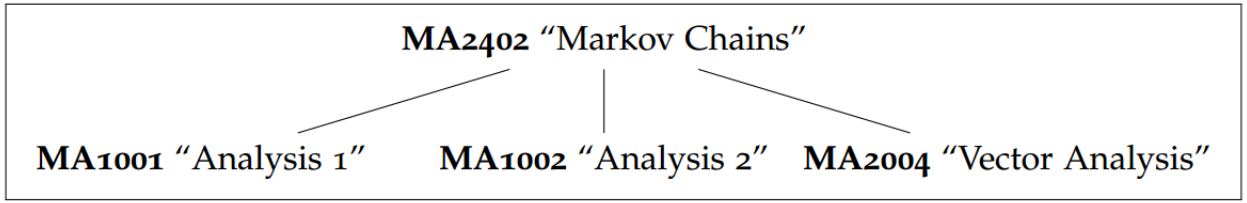


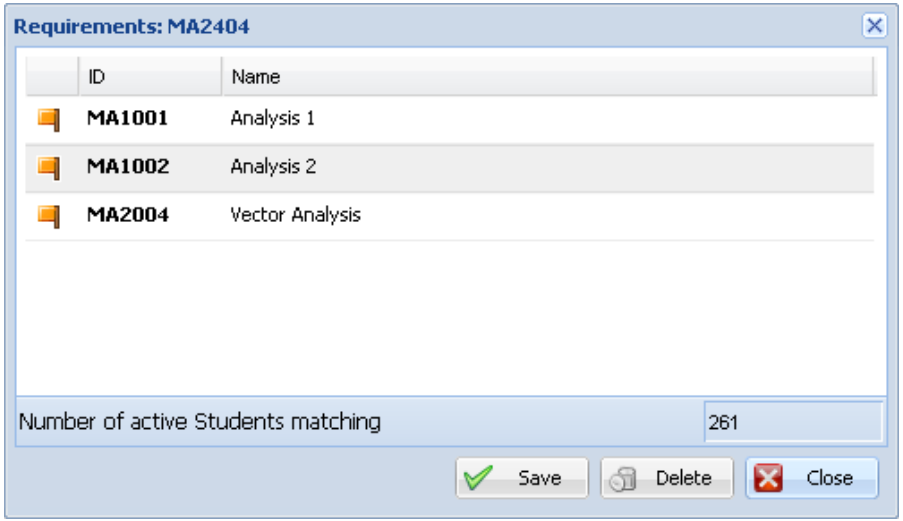
Lecturer's Recommendation (3)

- Module will be recommended

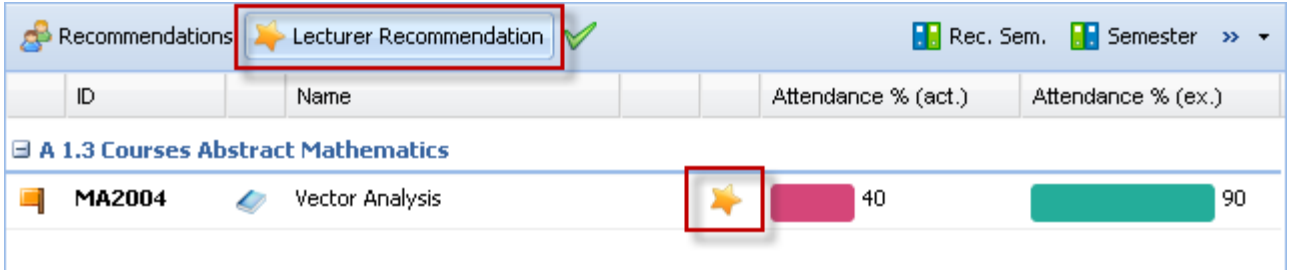


Lecturer's Recommendation (4)

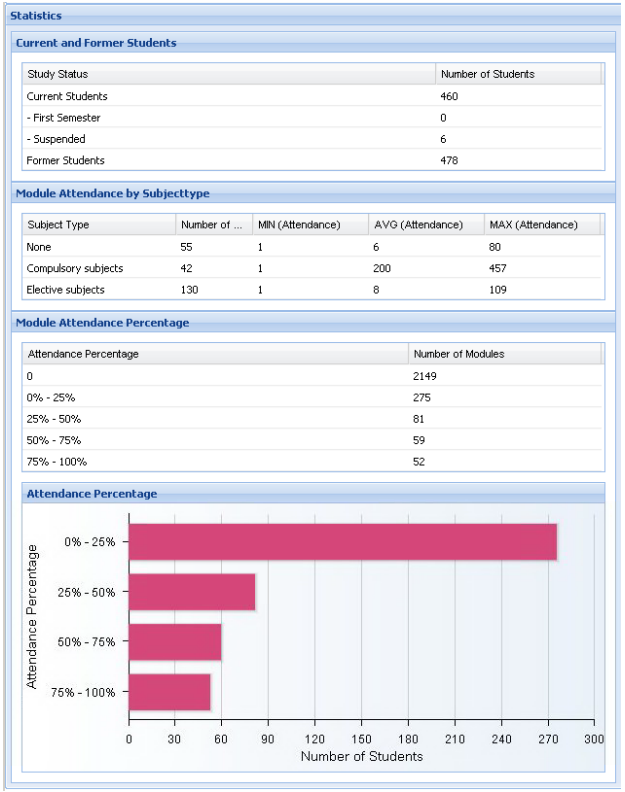




Lecturer’s Recommendation (5)



Statistics Feature



Conclusion

- Commercial use of lecturer’s recommendation feature
- Collaborative filtering needs pre-existing data
- Agile development
- Real world evaluation missing

Future

- Production Environment
- Master Projects
  - based on this project started
  - complex recommendation algorithms
- Evaluation

Technical Details (1)

- CAMPUSonline DB (Oracle 11g)
  - Materialized Views
  - Java-Persistence-API (JPA)
- GWT 2.4
  - Declarative UI in XML (Ui-Binder)
  - Dependency Injection (Gin, Guice)
  - Internationalization I18N (Server, Client)
  - Resource Bundles, Messages
  - Services (Request Factory)

Technical Details (2)

- GWTP 0.7 (GWT Platform)
  - Actions, Presenter
  - MVC-Pattern
- GXT 3.0
  - UI-Component-Library (UiBinder)
  - Grid, Tree, Buttons etc
- Maven
- Source Github
  - https://github.com/lr86/ModuleRecommender