

# KTP - knowledge base week 4

Group: 1

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## Domain Model

Our expert system is divided into classes:

Course

Student

Academic Planning

### Course:

Course code: The course code for a particular course e.g. WBAI023-05 which is the course code for Artificial Intelligence 1

Course name: The name of the course e.g. Artificial Intelligence 1

Course type : Mandatory/Elective/Practical: Whether the course is mandatory or an elective or a practical you can choose to take

Language of instruction: The language this course is given in, can either be dutch or English

Period: The block this course is given in

Credits (ECTS): Amount of credits you receive when you pass the course

Prerequisite number: The number of courses that this course is a prerequisite for

Prerequisite: The courses that need to have been passed to follow this course

Advised: The courses that are advised to have been passed to follow this course

Grade: The grade the student received when the course was followed before. It is negative 1 when the course has not been followed before.

Liked course: Yes or no. Whether the student enjoyed or not the course.

Orientation: cs or non-cs course.

### Student:

Current Year: no need, we assume from the year the student is scheduling

Current Block: no need, we assume from the block the student is scheduling

Passed courses:

Failed course:

Practical credits:

Current credits:

Started bachelor project: Yes or no.

Motivation: How much motivation the student has for studying. - not implemented yet in the rule model

WantExtra5credits: Yes or no. Whether the student wants or not to follow a fourth course.

RecommendExtra5Credits: Yes or no. Whether we recommend or not a fourth course to the student.

ValidReason: Yes or no. Whether the student's reason to follow the fourth course is valid (bored, apply to honours) or not (catch up).

**Academic Planning:**

Year: The year you want to plan for

Block: The specific block you want to plan for.

Courses Available: Courses that are given in this block

Courses Recommended: List of courses that we recommend to the student for this block

Recommended Electives: List of electives that we present to the student to choose from

Possible courses: Temporary list where we hold possible courses

Other available electives: List of electives that are not recommended, but available

showOther: Yes or no. If yes, it also shows other available electives to the student. Otherwise, only the recommended courses and electives are shown.

checkedMandatoryCourses: Yes or no.

checkedPracticalCourses: Yes or no.

checkedElectiveCourses: Yes or no.

finished: Yes or no.

finishedElectives: Yes or no. It is yes when we finished looking at the elective courses.

**Rule Model**

#	if	then
1	if course is practical & there are no prerequisites	add prerequisite course from advised courses
2	(Var:WantExtra5credits) is true & valid reason (reason is bored or reason is applying for honours) & failed courses = 0	recommendExtra5Credits set to true
3	(Var:WantExtra5credits) is true & valid reason & failedCourses = 1 & grades are high	recommendExtra5Credits set to true
4	((Var:WantExtra5credits) is false or not valid reason or failed courses > 1)	recommendExtra5Credits set to false
5	if recommendExtra5Credits is set to true & recommended courses is total 20 credits	Academic Planning finished set to true (Advice presented)
6	if recommendExtra5Credits is set to false & recommended courses is total 15 credits	Academic Planning finished set to true (Advice presented)
7	if practical credits $\geq 15$	all practical courses turn into electives

Table 1: Rules that apply to all years

#	if	then
1	Academic Planning year: is 1st year & (Academic Planning block) is 1a & recommended courses is not empty & RecommendExtra5Credits is false	Academic Planning finished set to true (Advice presented)
2	Academic Planning year: is 1st year & recommended courses is empty	recommend courses set from Ocasys (15 credits mandatory courses)
3	(Academic Planning year: is 1st year & RecommendExtra5Credits) is true & (Academic Planning block) is not 1a	Put all courses that meet the prerequisites that are in (Academic Planning block) in (Academic Planning possible courses)
3	Academic Planning year: recommendExtra5Credits course is set to true & 1st year & (average grade for cs courses > non cs courses)	delete non-cs course from possible courses
4	Academic Planning year: recommendExtra5Credits is set to true & 1st year & (average grade for cs courses < non cs courses)	delete cs courses from possible courses
5	if there are mandatory courses in (Academic planning possible courses) & 1st year	delete other courses
6	if there are no mandatory courses in (Academic planning Possible courses) & speaks Dutch	recommend Dutch course
7	if there are no mandatory courses in (Academic planning possible courses) & does not speak Dutch	recommend English course
8	if (Academic planning possible courses) total credits is 5 credits & recommend 5 extra credits is true & (Academic planning year) is first year	recommendExtra5Credits is true

Table 2: 1st year rules

#	If	then
1	Academic Planning year: is Not first year & recommend courses is empty & possible courses is empty	Recommend (List: failedCourses) from 1st year & put all mandatory 2nd and 3rd year courses into possible courses & checked-MandatoryCourses to true
2	Academic Planning year: is Not first year & course that does not meet prerequisites in possible courses	delete that course from possible courses
3	Academic Planning year: is Not first year & total amount of credits for courses in (List: courses recommended) is smaller than 15 credits & possible courses is not empty & checked-PracticalCourses is False	put the course from possible courses with the highest number of prerequisites to recommended courses.
4	Academic Planning year: is Not first year & total amount of credits for courses in (List: courses recommended) & recommend 5 extra credits course is true & possible courses is not empty & checkedPracticalCourses is False	put the course from possible courses with the highest number of prerequisites to recommended courses.
5	Academic Planning possible courses: is empty & checkedMandatoryCourses is True & checkedPracticalCourses is False & total amount of credits for courses in (List: courses recommended) is smaller than 15 credits	put practical courses into possible courses & checkedPracticalCourses to True
6	Academic Planning year: if Academic planning possible courses: is empty & checked-MandatoryCourses is True & checkedPracticalCourses is False & courses recommended is smaller than 20 credits & recommendExtra5Credits is true	put practical courses into possible courses & checkedPracticalCourses to True
7	Academic Planning year: is Not first year & courses recommended is smaller than 15 credits & possible courses is not empty & checkedPracticalCourses is True & checked-ElectivesCourses is False	put the course from possible courses with the highest average of prerequisites to recommended courses.
8	Academic Planning possible courses is empty & checkedMandatoryCourses is True & checkedPracticalCourses is True & checked-ElectivesCourses is False & recommended courses is smaller than 15 credits	put elective courses into possible courses & set checkedElectiveCourses to True
9	Academic Planning possible courses is empty & checkedMandatoryCourses is True & checkedPracticalCourses is True & (student courses recommended) is smaller than 20 credits & recommendExtra5Credits is true	put elective courses into (Academic planning: possible courses) & set checkedElectiveCourses to True
10	Academic Planning checkedElectiveCourses is set to true & not 1st year & (average grade for cs courses > non cs courses)	move non-cs course from (Academic Planning possible courses) to Other available electives & finishedElectives is true
11	Academic Planning checkedElectiveCourses is set to true & not 1st year & (average grade for cs courses < non cs courses)	move cs course from possible courses to Other available electives & finishedElectives is true
12	Academic Planning finishedElectives is true & (total credits from recommended courses and Recommended Electives $\geq$ 15) & recommendExtra5Credits is false	move possible courses into recommended electives & showOther set to false & Academic Planning finished set to true (Advice presented)

Table 3: 2+ year

The names Bachelor's project a and Bachelor's project b are names for the course we use for the Bachelor's project when you follow it in blocks 1a or 2a, and 1b or 2b respectively. Whereas the number of credits for Bachelor's Project a is 5, the number of credits for Bachelor's project b is 10.

13	Academic Planning finishedElectives is true & (total credits from recommended courses and possible courses $\geq 20$ ) & recommendExtra5Credits is true.	move possible courses into recommended electives & showOther set to false & Academic Planning finished set to true (Advice presented)
14	Academic Planning finishedElectives is true & (total credits from recommended courses and Recommended Electives $\leq 15$ ) & recommendExtra5Credits is false	showOther set to true & move possible courses into recommended electives & Academic Planning finished set to true (Advice presented)
15	Academic Planning finishedElectives is true & (total credits from recommended courses and possible courses $\leq 20$ ) & recommendExtra5Credits is true.	showOther set to true & move possible courses into recommended electives & Academic Planning finished set to true (Advice presented)
16	Academic Planning year: is higher than 3 & block is 1a & current credits $\geq 135$ & first year courses are all in passed courses & Statistics is in passed courses & Data analytics and communication is in passed courses & checkedMandatoryCourses is True & checkedPracticalCourses is False & Started bachelor project is False	put Bachelor's Project a into recommended courses
17	Academic Planning year is higher than 3 & block is 1b & checkedMandatoryCourses is False & checkedPracticalCourses is False & Started bachelor project is True	put Bachelor's Project b into recommended courses
18	Academic Planning block is 2a & current credits $\geq 135$ & first year courses are all in passed courses & statistics is in passed courses & data analytics and communication is in passed courses & checkedMandatoryCourses is True & checkedPracticalCourses is False & Started bachelor project is False	put Bachelor's Project a into recommended courses
19	Academic Planning block is 2b & checkedMandatoryCourses is False & checkedPracticalCourses is False & Started bachelor project is True	put Bachelor's Project b into recommended courses

Table 4: 2+ year part 2