

01: Department Teachers

```
Teacher (department="KSI") [name]
```

02: Study Results

```
(
  Enrollment (student=4301 AND semester=191)
  *
  Course
) [code, title, result]
```

```
... Enrollment (student=4301) (semester=191) ...
```

```
... Enrollment (semester=191) (student=4301) ...
```

03: Subordinate Teachers

```
(
  (
    Teacher (name="Tomáš Skopal") [id]
    [id=chair]
    Department
  ) <name→department> [department]
  *
  Teacher
) [name]
```

```
(
  (
    Teacher [name, department]
    *
    Department <name→department>
  ) [name, chair]
  *
  Teacher [id, name] <id→chair, name→boss>
) [name, boss] (boss="Tomáš Skopal") [name]
```

04: Permitted Courses

```
(
  Schedule (semester=192) (day="MON" OR day="FRI") <course→code>
  *
  Course
) [code, title]
```

```
Schedule (semester=192) (day="MON" OR day="FRI") <course→code> [code]
```

```
*
Course [code, title]
```

```
(
  Schedule(semester=192) (day="MON") <course→code> [code]
  U
  Schedule(semester=192) (day="FRI") <course→code> [code]
)
*
Course [code, title]
```

05: Prohibited Courses

Incorrect:

```
(
  Schedule(semester=192) (not (day="MON" OR day="FRI")) <course→code>
  *
  Course
) [code, title]
```

Incorrect:

```
Schedule(semester=192) (day≠"MON" AND day≠"FRI") <course→code> [code]
*
Course [code, title]
```

Correct:

```
(
  Course [code]
  \
  Schedule(semester=192) (day="MON" OR day="FRI") <course→code> [code]
)
*
Course [code, title]
```

06: Inactive Students

```
(
  (
    Student [id]
    \
    Enrollment(semester=191 OR semester=192) <student→id> [id]
  )
  *
  Student
) [name, address]

(
  Student
  ▷
  Enrollment(semester=191 OR semester=192) <student→id>
) [name, address]
```

07: Eager Students

Enrollment(semester=192)<student→id>[id,code]

÷

Schedule(semester=192)<course→code>[code]

R := **Enrollment**(semester=192)<student→id>[id,code]

S := **Schedule**(semester=192)<course→code>[code]

R ÷ S ≡

```
(
  R[id]
  \
  ((R[id] × S) \ R)[id]
)
```

08: Timetable Conflicts

Event := (**Schedule**[room=number]**Room**) [semester,teacher,day,time,building]

```
(
  Event<semester→s1,teacher→t1,day→d1,time→m1,building→b1>
  [s1=s2 AND t1=t2 AND d1=d2]
  Event<semester→s2,teacher→t2,day→d2,time→m2,building→b2>
)
...
```

```
(
  (
    (
      Event<time→m1,building→b1>
      *
      Event<time→m2,building→b2>
    )
    (m1<m2)
    (semester=201)
    (
      ((b1=b2) AND (m1+90+15>m2))
      OR
      ((b1≠b2) AND (m1+90+60>m2))
    )
  )
) [teacher]<teacher→id>
*
Teacher
) [name]
```