

LOGIC and SETS

Formale Systeme

3VO + 2PS

Lecturer:

Ana Sokolova

Instructions:

Ana Sokolova

Sebastian Arming

Elmar Eder

<http://cs.uni-salzburg.at/~anas/FormaleSysteme2020/>

<http://cs.uni-salzburg.at/~anas/FormaleSystemeProseminar2020/>

and offline
online !

Schedule and Rules

poll

Check PlusOnline,
Blackboard, webpage

- **Lectures** Monday 2:15 pm - 3:00 pm in T01
Thursday 10:15 am - 12 am in T01
- **Instructions**
 - Group 1, Thursday 1:15 pm - 3 pm (AS) in T01
 - Group 2, Thursday 3:15 pm - 5 pm (AS) in T01
 - Group 3, Thursday 1:15 pm - 3 pm (SA) **online (and T02)**
 - Group 4, Thursday 3:15 pm - 5 pm (EE) in T02
- **Tutors** Alexander Loitzl and Emanuel Petter
Day and room t.b.a
- **Books**
 - Logical Reasoning: A First Course by R. Nederpelt and F. Kamaraddine
 - How to Think Like a Mathematician by K. Houston
 - Modellierung: Grundlagen und formale Methoden by U. Kastens and H. Kleine Büning

Instructions (PS)

- **Instruction exercises** in Blackboard on Thursday evenings
- To be solved by the students (ideally alone)
- In class we will have a small **test** every week except the first week (**1 simple exercise**) and then present solutions/discuss the exercises (**sometimes students will be asked to present**)
- **Different in the online group — homework (instead of test) via Blackboard**

Instructions (PS) grading

- The test/homework exercise will be graded each week
- The graded exercise will be returned to you in class (with feedback) one week later, or online in Blackboard
- **Grade** based on
 - (1) the grades of the test/homework exercises and
 - (2) activity in class (ability to present solutions)
- All information about the course / rules / exams / grading is / will be on the course webpage and PlusOnline

Lecture (VO) Exam

- Written exams
- **Written exam** in February, April, and July or **two partial tests during the semester**
- Grade based on the # of points on the written exam (or sum of the points on the partial tests)
- For better grade **oral exam** after the written one **upon appointment**
- You pass the course if you have 55% of the maximal points on the exam.

Partial Tests (VO)

- One test end of November, one beginning of February
- The tests are **partial** (half material)
- You pass via tests if the sum of your points on both tests is at least 55% of the sum of maximal points on the tests **and** if on each test you have at least 20% of the maximal points
- The tests and the exams consist of exercises / questions related to the material taught in class
- We will implement some registration for the tests

Presence

in Corona-times,
online presence counts

- Presence is **obligatory in the PS** not in the VO
- You may miss up to **1 week** of PS classes, for anything beyond that a justification is needed
- Whenever you are ill / have a cold, please join the online PS group and the online VO classes — **do not come to the university** please. Email your PS instructor for approval and the link for the online meeting.

Teaching and Studying in Corona Times

- Both challenges and opportunities
- Things may change on short notice
- Be adaptive
- Be considerate

we will setup Blackboard groups for each week to which you can register

Our VO classes will be “hybrid”.
Up to 28 students will be present in the classroom.
The remaining students will participate online.

The Online Mode (VO)

- **Offline online** means: Videos will be made available to you every week (ready to watch on Thursdays 10-12, without us meeting them).
- In addition we will have an **online online** :-) hour of Webex meeting (to be scheduled) for discussion / questions related to the video materials.

Our VO classes will be “hybrid”.

Up to 28 students will be present in the classroom.

The remaining students will participate online.

Plan B



In case of further
corona-related problems



Everyone participates online.

Important Webex Information

- If trying to access Webex via Blackboard causes errors, we suggest to alternatively log in via <https://uni-salzburg.webex.com/> directly.
- Students of the mini-curriculum CS-for-all “Informatikkompetenz für alle” are invited to register via e-mail to ifa@cs.sbg.ac.at.

Some advice

- It starts easy, but soon it gets more difficult
- There accumulates lots of material for the exam
- Best is to regularly study, practice, solve the exercises yourself!

ECTS points

1 ECTS = 25 hours

- 3 ECTS for the lectures (VO)
- 4 ECTS for the instructions (PS)

$7 \times 25 = 175$ hours

in class app. 50 hours

125 hours remain for
your studying !

better: 1 week before exam (40
hours) + 7 hours a PS week

app, 10 hours a
PS week :-)

and understand !

Goals:

At the end of the course,
you will be able to:

- **Read** - formal mathematical statements, proofs
- **Write** - formal mathematical statements
- **Manipulate** - logical formulas
 - basic notions of set theory
- **Prove** - properties in basic set theory,
 - tautologies
- **Argue** about validity and truth
- **Understand, construct, reason about** - basic models of computation (finite automata)

Goals:



Image source: Springer



We will learn

starting next week

- **Logical Calculations** - propositional logic, predicate logic
- **Logical Derivations** - reasoning, natural deduction
- **Naive Set Theory** - sets, relations, mappings, numbers and structures, ordered sets
- **Basics of formal models** - finite automata, transition systems, graphs, grammars...

What is logic ?

