Lecture 0 - Course Policy and Introduction

Vaishnavi Sundararajan

COL703/7203 - Logic for Computer Science

1 Logistics

2 Actual logic!

Teaching staff

Instructor   Vaishnavi Sundararajan

TAs   Kushagra Gupta (cs5210592@cse.iitd.ac.in)

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Vikash Pandey (jcs242613@csia.iitd.ac.in)

Instructor Office Hours: 1400–1500 Mondays and Thursdays

Pages to check regularly

Course webpage: For lecture notes and other material:

https://vaishs.github.io/courses/col703-jul25/

Piazza: All discussion and Q&A will be done on Piazza. You should be enrolled to the course page on Piazza. All course announcements will be sent out via Piazza.

Gradescope: We will use Gradescope for practicals and exam uploads.

Send an email if you have not been enrolled to Piazza.
(You might need to activate your account.)

Q&A and contacting the teaching staff

- Email is only for queries of an individual nature – anything technical or logistical must be posted on Piazza.

- It is especially not okay to use email to ask about logistics issues that might affect the entire class. Stick to Piazza for those concerns.

- Before posting on Piazza, check if the same question has been asked by someone else before. Do not repeat posts.

- For individual queries, do not contact the teaching staff via means other than email. Any email needs to be sent to Vikash with me in cc, with "COL703/COL7203" in the subject. Emails not following this template will not be read.

- We are but human, and sometimes it might take us up to two days to respond to a query. Be patient, and account for such delays.

Prerequisites

- Ability to write and understand rigorous formal proofs (especially those involving induction)
- Some minimal programming background; but no prior knowledge of any specific language is required
- Should have taken **at least one** of the following courses (or equivalent)
  - COL106 (Data Structures & Algorithms)
  - COL202 (Discrete Mathematical Structures)
- It is helpful to have done some course where you have had to write rigorous proofs and/or analyze abstract formal objects

References

- Will mostly follow slides/notes presented in class
- Will upload notes and supplementary material to the course webpage
- External references:
  - Introduction to Formal Logic, by Peter Smith:
    https://www.logicmatters.net/ifl/
  - Formal Logic: Its Scope and Limits, by Richard C. Jeffrey:
    https://archive.org/details/formallogicitssc0000jeff_d0z0/ (also available in the IIT library)
  - Hyper-notes for Logic in Computer Science by Prof. S. Arun-Kumar:
    https://www.cse.iitd.ac.in/~sak/courses/ilcs/2020-21/ilcs.pdf

Evaluation policy

- Practicals: 20%
  - We will learn to use some theorem provers in the practical sessions. You will require a laptop which can install VSCode and Rocq/Lean. (Installation instructions will be provided before the practicals begin.)
  - Attendance is mandatory in the practicals. For every practical slot where you are absent, you will lose 3% of the potential 20%.

- Minor: 20%
  - No re-minor will be conducted.
  - Produce appropriate documentation within one week of the minor if you miss it for a medical reason.
  - In the above case, marks for the major will be scaled up accordingly.

- Major: 40%. Will include everything covered in the course.

Evaluation policy (Contd.)

- Quizzes: 15–20%.
  - Surprise quizzes conducted in class (How many? Surprise!)
  - Absence in a quiz directly marked 0.
  - No make-up quizzes will be conducted.
  - Best n-1 out of n considered.

- In-class participation, attendance etc: 0–5%.

- Best example(s) of real-world situations modelled in logic: 0–5% **Bonus**

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- Important to know when inference is sound!

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How do we solve these?

- Can do case analysis with a truth table
- Only Alice is a knight, only Bob is a knight, both are knights, both are knaves
- Allows us to draw contradictions/impossibilities (using some **valid system of inference**)
- Can rule out all but one (the correct!) case
- In some cases: can do smarter analysis than looking through the entire truth table.

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- Probably not a great idea to do exhaustive case analysis here!

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DAH! MY CABBAGES!

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- You run into one of them unexpectedly, and want to know if it is Bella
- You can ask a question of up to three words to find out who it is
- What question would you ask?