VI. SUMMER SCHOOL OF LOGIC

Logic in Philosophy Workshop: Incompleteness and Intuition

Centre for Logic and Decision Theory, University of Rijeka

September 09 - 14, 2024

Monday 09.09.24

09:00-11:00 *Meeting of the International Seminar Ofra Rechter via Zoom*

18:30 gathering in Rijeka

19:30 dinner

Tuesday, 10.09.24:

09:00-09:30

Opening

09:30-11:00 Edi Pavlović (LMU): *Proof Theory Tutorial* (i)*Sequent calculi and their properties*

> The purpose of proof theory is to build well-behaved proof systems. In this class we introduce such systems, called sequent calculi, discuss what properties make them behave well, how to obtain them, and what they're useful for.

11:00-11:30 break

11:30-13:30 Edi Pavlović (LMU): *Proof Theory Tutorial-* (ii) *Geometrization*

> Having obtained well-behaved proof systems, we now want to utilize them (say, in philosophy) without compromising all the good work we did in the previous class. To that end we introduce and use a process called geometrization. It has nothing to do with geometry.

13:30-15:00 Lunch

15:00-17:15 Ofra Rechter (Tel-Aviv U): *Finitism and "Mathematical Intuition" from a Critical point view*

Wednesday, 11.09.24:

09:30-11:00 Giulio Fellin (Brescia/Verona) Tutorial: *Constructive Reasoning in Mathematics and Logic: Foundations, Proof Techniques, and Conservation*

We examine the foundations and implications of constructivism in mathematics and logic, tracing its evolution from classical to modern approaches. We begin by outlining the philosophical and methodological shifts that distinguish constructivism, particularly intuitionism, from classical reasoning. Central to this exploration is the requirement in constructivist thought to explicitly construct objects to prove their existence, contrasting with classical methods that allow for non-constructive proofs. We delve into the Brouwer–Heyting–Kolmogorov (BHK) interpretation of intuitionistic logic. Through examples like Russell's Theorem and the irrationality of $\sqrt{2}$, we highlight how intuitionistic logic reinterprets traditional proofs, emphasizing proof of negation over proof by contradiction. We also address the limitations imposed by intuitionistic principles on widely accepted mathematical constructs, such as the Axiom of Choice. Finally, we discuss the shift in foundations towards identifying which parts of classical mathematics can be directly

translated into constructive terms, with a focus on the conservativity of classical logic over intuitionistic logic, exemplified by Glivenko's Theorem.

11:00-11:15 break

11:15-12:45 Nenad Smokrović (Rijeka): Tutorial- *Epistemic Closure and Logical Omniscience*.

Brief introduction concerning encounter of logic (modal epistemic logic) and philosophy (epistemology) in formal epistemology.
Remarks on logical omniscience problem.
Introduction to modal language and semantics.
Semantics: Relational structure, models and frames.
A brief overview of different solutions to logical omniscience problem.

13:30-15:30 lunch

15:30-17:00 Richard Zach (Calgary) : Quasi-Tutorial on *Hilbert, consistency proofs and epsilon-0*.

Thursday, 12.09.24:

Morning session: Student Presentations

13:00-14:00 Lunch

14:00-15:30 Peter Koellner (Harvard): Disagreements in mathematics: the case of CH.

15:30-16:00 break

16:00-17:30 Montgomery Link (Suffolk): Gödel's Project on the Continuum

Friday, 13.09.24:

09:00- 10:00 Giulio Fellin (Brescia/Verona): Double negation shifts as conservation criteria

10:00-10:15

10:15-11:15 Norbert Gratzl (LMU): potentialism about infinity

11:15-11:30 break

11:30-12:30 Zvonimir Šikić (Rijeka): What are Laws and what are they for?

Saturday, 14.09.24
Individual Student Projects' Tutorials