

Substructural Logics

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Abstract:

Substructural logics cover many important nonclassical logics like many-valued logics, fuzzy logics, linear logic and relevant logics. A distinguished feature of the study of substructural logics is that it can offer a uniform framework by which these various logics introduced by different aims and studied separately. But, why and how is this possible?

This is an introductory course on substructural logics. Both proof-theoretic and algebraic approaches to the subject will be explained, and then close connections between them will be shown. At the end, I would like to give you an answer to the above question.

Topics to be covered in 3 days:

I-1 Introduction

I-2 Sequent systems and cut elimination

I-3 Discussions -- Hilbert-style formulations, natural deduction systems

II-1 More on proof-theory

II-2 Residuated lattices

II-3 Discussions -- Kripke-type semantics

III-1 Logics and varieties

III-2 More on algebraic approach

III-3 Discussions -- why sequent systems and why residuated structures?