

Ilya Juhnowski  
Вопрос формализации  
Обзор

Модальная логика

# Язык теории

1. Каждый объект, который иллюстрирует свойство иметь пространственно-временного расположения (spatiotemporal location) не может кодировать свойства.

E! - обозначает свойство иметь свойство пространственно-временного расположения. Объекты, как ты, я, компьютер, планета Земля, Солнечная система, Млечный Путь, скалы, деревья и т.д., обладают свойством иметь пространственно-временное расположение. Таким образом, теория утверждает, что такие объекты не кодируют свойства. Свойства будут закодированы только абстрактными объектами.

# Look Great Every Time

* Need a heading? On the Home tab, in the Styles gallery, just click the heading you want. Notice other styles in that gallery as well, such as for a quote or a numbered list.
* You might like the photo on the cover page as much as we do, but if it’s not ideal for your report, right-click it and then click Change Picture to add your own.
* Adding a professional-quality graphic is a snap. In fact, when you add a chart or a SmartArt diagram from the Insert tab, it automatically matches the look of your report.



## Give It That Finishing Touch

Need to add a table of contents or a bibliography? No sweat.

### Add a Table of Contents

It couldn’t be easier to add a table of contents to your report. Just click in the document where you want the TOC to appear. Then, on the References tab, click Table of Contents and then click one of the Automatic options.

When you do, the TOC is inserted and text you formatted using Heading 1, Heading 2, and Heading 3 styles is automatically added to it.

### Bibliography

# Coalgebras and Modal Logic

[**Alexander Kurz**](http://www.cwi.nl/~kurz/)**Section: Logic and Computation   
Level: Advanced**

## Description

Whereas algebras are used to model abstract data types, coalgebras are used to model dynamic, state based systems. One of the achievements of the theory of coalgebras is to make clear that these seemingly different areas are related by duality. The aim of the course is to explain this duality and to develop some consquences. In particular, recent research lead to the insight that---in a sense made precise in the lectures---modal logic is dual to equational logic.

## Prerequisites

* Computation: Familiarity with the basics of some of the following: abstract data types, automata, transition systems, process algebra (to understand the examples and applications);
* Logic: First order predicate logic;
* Category Theory: Basic notions (category, functor, natural transformation, limit, adjunction).

## Materials

[PDF](http://docs.google.com/viewer?url=http://www.helsinki.fi/esslli/courses/readers/K40.pdf)lecture notes

## Lecturer

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# Algebraic Tools for Modal Logic

[**Mai Gehrke**](http://www.math.nmsu.edu/mgehrke/mgehrke.html)**and [Yde Venema](http://turing.wins.uva.nl/~yde/" \t "_parent)   
Section: Logic   
Level: Advanced**

**Description**

There is a long and strong tradition in logic research of applying algebraic techniques in order to deepen our understanding of logic. Such applications are possible because many logics correspond to classes of algebras; typically, the consequence relation of the logic translates into the equational theory of the corresponding class of algebras.

This correspondence between logic and algebra allows one, on a first level, to study the algebras in order to understand the deductive system. But metalogical properties also often end up having algebraic counterparts. In modal logic, a striking example of this phenomenon can be found using the duality theory between Kripke structures and Boolean Algebras with Operators. For instance, a modal logic is complete if and only if its corresponding algebraic variety is generated by the class of algebras that are dual to the Kripke frames of the logic.

A central tool in proving completeness for modal logics is the notion of canonicity, which has both a logical and an algebraic expression. Another problem related to the completeness problem is the translation of axioms for a logic into properties of the Kripke frames. This is the concern of so called correspondence theory.

Apart from giving a general introduction to the fundamental ideas and methods of applying algebra in logic, the purpose of the course is to present recent developments from algebra as well as modal logic, in an integrated format. Our intention is to illuminate and generalize existing results concerning the issues of completeness, canonicity and correspondence for Kripke style semantics for modal and generalized modal logics.

In the first part of the course we give a general introduction to the algebraic perspective on logic. As our running examples we take classical propositional logic and modal logic. We show how the technical notion of a modal logic corresponds to the algebraic one of a variety of Boolean algebras with operators, and we discuss the connection between logical and algebraic properties.

In the last three lectures we concentrate on canonicity and correspondence. The notion of canonicity plays an equally fundamental role in the theory of modal logic as in the algebraic theory of Boolean algebras with operators. For a long time the algebraic and the logical strand of research have been carried out in relative isolation. The aim of this part of the course is threefold: (i) to introduce the notion of canonicity, both from the logical and from the algebraic perspective, (ii) to survey some of the connections between the two areas, and (iii) to present some recent results in the field that generalize and illuminate the classical results.

**Prerequisites**

We assume that the students have some basic knowledge of modal logic and exposure to lattice theory (to be specified in due time).

**Materials**

[[PDF](http://docs.google.com/viewer?url=http://www.helsinki.fi/esslli/courses/readers/K15.pdf)lecture notes](http://docs.google.com/viewer?url=http://www.helsinki.fi/esslli/courses/readers/K15.pdf)

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# BASIC CONCEPTS IN MODAL LOGIC

by Edward N. Zalta

**Publisher**: Stanford University 2011  
**Number of pages**: 92

**Description**:  
This is a text for dedicated undergraduates with no previous experience in modal logic. The book should prepare people for reading advanced texts in modal logic, such as Goldblatt, Chellas, Hughes and Cresswell, and van Benthem.

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