# Applying Modal Logic to Philosophy & AI (course overview)

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Formal Methods, Second Semester 2007

# What is Modal Logic?

**Logic** is typically concerned only with **sentences** that can be assigned a **truth-value** (true or false).

Example: *The cat is on the floor.*

But not: *Put the cat on the floor!*

**Modal logic** can deal with a wider range of sentences, i.e., those that can be assigned a truth-value **in a qualified way**.

*The cat may be on the floor.*

*I know that the cat is on the floor.*

*The cat will be on the floor.*

*According to Edgar, the cat is on the floor.*

*It is proven that the cat is on the floor.*

*Because the cat is on the floor [, the dog is on the sofa].*

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Philosophy

- Metaphysics (necessary vs. contingent beings, and essential vs. accidental properties)

- Epistemology (knowledge, belief, information)

- Philosophy of Language (propositional attitudes and referential opacity)

- Formal Semantics (the meaning of *if. . . then*)

Artificial Intelligence

- Belief Revision

- Semantic Web

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**L1:** Propositional Modal Logic

**L2:** Predicate Modal Logic

**L3:** Nature and Existence of Possible Worlds

**L4:** Metaphysics (1)

**L5:** Metaphysics (2)

**L6:** Knowledge and Belief

**L7:** Information

**L8:** Quantifying into Espistemic Contexts (1)

**L9:** Quantifying into Espistemic Contexts (2)

**L10:** Counterfactuality and Belief Revision

**L11:** Semantic Web and Description Logic

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The course is technical and philosophical at the same time.

**Main goals of the course:**

- Create awareness of the relevance and fruitfulness of the application of formal methods to philosophy.

- Develop the ability to argue philosophically by using tools from formal logic.

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**Grading:**

- Four homework assignments handed out on a weekly basis. Each assignment is worth 25 % of the final course grade.

- It is mandatory to attend at least eight out of eleventh lectures.

## Organizational Matters

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