

Higher-Order Computability*

2+1 Vertiefungs-/Ergänzungsmodul in Logic, SoSe 2019

* Listed in TUCAN as *Selected Topics in Logics: Higher-order Computability*

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Higher-order functionals (functions which take another function as an input) are of central importance in mathematical logic and computer science. This is an introductory course on higher-order computability theory. We will cover the basics of the subject, including Gödel's System T, Plotkin's PCF and models of higher-order computation. A particular emphasis will be placed on connections to both proof theory and programming languages.

During the course, students will gain an understanding of:

- Gödel's System T and its key properties;
- various ways of characterising higher-order computability;
- models of higher-order functionals, in particular the continuous functionals;
- theoretical aspects of functional programming languages, including how notions such as termination and complexity can be lifted to a higher-order setting.

Suggested prerequisites are either *Introduction to Mathematical Logic* or *Formale Grundlagen der Informatik I,II*, although the module will be as self-contained as possible.

For further information please knock, or write me an email at
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First lecture takes place Monday 15 April 9:50-11:30 in S103/11

Schedule for remainder of semester (including exercise classes) will be discussed during the first lecture