OST
Ostschweizer
Fachhochschule

MSE | MASTER OF SCIENCE
IN ENGINEERING

Modulbeschrieb

Programming Languages

Allgemeine Informationen

Modulbezeichnung

Programming Languages

Modulkategorie

Fachliche Vertiefung

Modulverantwortliche/r

Farhad Mehta

Anzahl der Credits

3

Durchführungssetting

Campus	□ Buchs	x Rapperswil-Jona	□ St. Gallen
Online Teilnahme	□ keine Onlineteilnahme möglich	x hybrid	□ ausschliesslich online
Durchführung	□ wöchentlich	□ als Blockwoche	x nach Absprache (Siehe unten)

Ziele, Inhalt und Methoden

Lernziele, zu erwerbende Kompetenzen

All participants are able to independently understand and explain scientific results in the field of programming language theory and its applications in programming and software engineering.

In particular, all participants must be able to independently:

- Acquire, read, and understand scientific literature on a chosen topic.
- Write a scientific article expressing their understanding of this topic.
- Present and discuss this topic to the other participants of this seminar.
- Positively contribute to a scientific discussion on the topics chosen for the seminar.

Although the topics chosen for this seminar are specific to its chosen field, participants must be able to apply the same research and presentation skills in other areas of science and engineering.

Modulinhalt

Programming language theory deals with the design, implementation, analysis, characterization, and classification of programming languages and their individual features. Although rooted in formal mathematics, it has widespread impact and applicability in the fields of programming and software engineering. It loosely includes the following as sub-fields:

- Type systems
- Program analysis
- Programming language design
- Program transformation
- Domain-specific languages

- Compiler construction
- Run-time systems
- Formal program semantics
- Formal methods in software engineering
- Comparative programming language analysis

Lehr- und Lernmethoden

Each participant is assigned a supervisor and a relevant topic of interest at the start of the seminar.
This is followed by an independent literature search and study of the assigned topic by the participant.
At the end of the seminar, each participant is expected to be able to express his understanding of the chosen topic to his peers in the form of a scientific paper and a scientific presentation. Additionally, each participant is expected to able to positively contribute to a scientific discussion on the topics chosen for the seminar.

The execution of the seminar is organised around the following milestones:

- M0: Kick-off and topic selection
- M1: Submission of outline of article
- M2: Outline presentation and discussion
- M2: Submission of first version of article
- M3: Submission of final version of article and first version of presentation
- M4: Presentation and discussion

The supervisor meets with the participant at or after each milestone in order to review and give feedback on the participant’s progress. Only participants with an adequate first version of their article will be allowed to continue with the seminar and present.

Voraussetzung, Vorkenntnisse und Eingangskompetenzen

- The ability and interest in programming and programming languages in general is an essential prerequisite for this seminar.
- Since almost all existing literature on this topic is in English, the seminar will be held in English. The ability to understand texts in English is therefore a prerequisite for this seminar.
- Interest and prior knowledge in related fields such as compiler construction, static analysis, functional programming or logic is recommended, but not essential.

Unterlagen

The topics for each execution of this seminar will be chosen at its start, depending on current developments in the field and the interests of each participant. Examples of relevant topics can be found within:

- Types and Programming Languages by Benjamin C. Pierce
- Principles of Program Analysis by Nielson, Nielson & Hankin
- The proceedings of various conferences in the field, such as POPL (Principles of Programming Languages), PLDI (Programming Language Design and Implementation), ICFP (International conference on Functional Programming), OOPSLA (Object Oriented Programming, Systems, Languages and Applications), ASPLOS (Architectural Support for Programming Languages and Operating Systems).
- Notable Journals in the field, such as TOPLAS (Transactions on Programming Languages and Systems) and JFP (Journal of Functional Programming).

Leistungsbewertung

Zulassungsvoraussetzung

A scientific article and presentation slides reviewed by the supervisor to be of adequate quality.

Prüfungsart

Oral Exam

Prüfungsdauer

30 min. Presentation & Discussion

Leistungsbewertung

The grade for this seminar will consist of an evaluation of the following aspects by the supervisor:

- Preparation & execution (planning, research)
- Article (content, structure, language)
- Presentation (content, structure, language, style, quality of answers)
- Participation in discussion (active participation, positive contribution to discussion, reflection w.r.t. chosen topic)