Advanced Discretization Methods

Module-No./Abbreviation	Credits	Workload	Term	Frequency	Duration
CE-WP34/DLE	3 CP	90 h	2nd Sem.	Summer Semester	1 Semester

Courses	Contact hours	Self-Study	Group Size:
Advanced Discretization Methods	2 SWS (30 h)	60 h	No Restrictions

Prerequisites

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Learning goals / Competences

After successfully completing the module, the students

- have acquired a solid foundation in the mathematical formulations, implementation aspects and application of advanced discretization methods for the solution of partial differential equations, such as the finite cell method (FCM) and isogeometric analysis (IGA),
- understand the advantages and disadvantages of each method and can independently evaluate their suitability for a given situation,
- can apply their knowledge to the solution of various engineering and scientific problems.

Content

The lecture covers advanced discretization techniques beyond the conventional finite element methods for the solution of partial differential equations, such as the finite cell method (FCM) and isogeometric analysis (IGA). In each case the mathematical formulation as well as the implementation aspects of the method are discussed and contrasted with conventional methods. Furthermore, the strengths and shortcomings of each method are highlighted such that their suitability for a given problem can be evaluated.

Teaching methods / Language

Lecture, Exercise (2h / week) / English

Mode of assessment

Written examination (120 min., 100%)

Requirement for the award of credit points

Passed final module examination

Module applicability

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Weight of the mark for the final score

Module coordinator and lecturer(s)

Prof. Dr. A. Vogel, Dr.-Ing. M. Saberi

Further information