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# Discrete and Computational Geometry (DCG)

3VO MAT.414UF + 1UE MAT.415UF, winter term  
17/18

The course will be held in English.

For further information (for example course times) see also the official TUGOnline pages of the [lecture](#) and the [exercises](#) part.

[Introduction slides](#)

## Course material

Here will be an overview of the content of the course, including some slides. More information to come during the term.

- October 4: Chromatic number of the plane; Convex Hull: Introduction, Divide and Conquer Algorithm 2D
- October 11: Convex Hull: Divide and Conquer Algorithm 3D. Triangulations Part 1 start.
- October 18: Triangulations Part 1 continued (Basics, Flips)
- October 25: Triangulations Part 2 start (Delaunay Triangulations)
- November 8: Triangulations Part 2 continued, Voronoi Diagrams start.
- November 15: Triangulations, exercises; Basic Theorems for (Point) Sets.
- November 22: Basic Theorems for (Point) Sets: exercises.
- November 28: Order Types.
- December 6: Order Types.
- December 13: Order Types, Simple Drawings.
- January 10: Simple Drawings and Rotation Systems.
- January 18: Simple Drawings and Rotation Systems.
- January 24: Simple Drawings and Rotation Systems; Arrangements.

## Exams

The first exam for the lecture part (VO) will be held on Tuesday February 6, 2018, from 10:00 to 12:00, in the lecture hall i12. Registration is already open.

## Literature and Links

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Here are some literature references.

- M. de Berg, O. Cheong, M. van Kreveld, and M. Overmars. Computational Geometry. Algorithms and Applications (third edition). Springer, Berlin, 2008.
- S.L. Devados and J. O'Rourke. Discrete and Computational Geometry. Princeton University Press, Princeton, 2011.
- P. Brass, W.O.J. Moser, and J. Pach. Research Problems in Discrete Geometry. Springer, New York, 2005.
- O. Aichholzer, B.Jüttler. Einführung in die angewandte Geometrie. Birkhäuser, Reihe Mathematik Kompakt, Springer Basel, 2014.
- T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein. Introduction to Algorithms (third edition). The MIT Press, Cambridge, 2009.
- F. Aurenhammer, R. Klein, and D.T. Lee. Voronoi Diagrams and Delaunay Triangulations. World Scientific Publishing Co. Pte. Ltd., 2013.
- J. Matoušek. Lectures on Discrete Geometry, Springer Graduate Texts in Mathematics

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Last Change: 02 Mar 2018, 15:43:20

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