

# Course introduction

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GEO1004:  
3D modelling of the built environment

<https://3d.bk.tudelft.nl/courses/geo1004>



3D geoinformation

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And you?

# Course contents

- How is the built environment modelled in 3D?
  - Fundamentals / concepts
  - Data models and data structures
  - Guest lecture: reconstructing a city in LoD2
  - Conversions and applications

# New-ish course

- 2019-2020: Entirely new contents
- 2020-2021: Improved materials
- 2021-2022: 3D book!
- 2022-2023: Further improving some materials as we go -> we'll make lessons available a short time before the schedule
- Feedback is appreciated!

# Prerequisites

- GEO1000 or knowledge of scripting/programming (in any language)
- GEO1002 or basic knowledge of GIS
- Optional: GEO1015 covers complementary topics (2.5D vs 3D)

# Blended learning

In your own time:

1. Watch videos
2. Read materials
3. **Most important:** work on assignments

# Contact hours?

Per week: 2x2h during Monday & Wednesday labs (13:45)

You can do everything in your own time, but during contact hours we will be there to help:

show demos, introduce course/assignments, answer questions, discuss common issues, help with assignments, general programming questions, feedback on assignments/exams, etc.

At other times, you can still ask questions on Discord. We might just take longer to answer.



# How to make the most of it

1. Keep up with the course schedule
2. Study lessons in advance
3. If you have any doubts, ask questions
4. Make sure you can answer questions (at the end of book chapters)
5. Optional: read one or two external sources (in notes in each chapter)
6. Spend more time on assignments than on lessons

# Lessons

- 1.1: Intro / DS and DM [K]
- 1.2: B-rep [K]
- 2.1: 3D DT / Voronoi [H]
- 2.2: Voxels / voxelisation [K]
- 3.1: ISO 19107 [H]
- 3.2: 3D city models [H]
- 4.1: MAT [K]
- 4.2: LoD2 reconstruction [R]
- 5.1: G-maps / c-maps [K]
- 5.2: Curves [K]
- 6.1: CSG / Nef polyhedra [K]
- 6.2: BIM [K]
- 7.1: Conversions [H]
- 7.2: Applications [K]

# Assignments

- Programming tasks using C++ and open source libraries
- 10% hw1, 20% hw2 and hw3
- 0: C++ preparation (no deadline / not marked)
- 1: Triangulating polyhedron faces (Mar 3) -> available from Wednesday
- 2: Enriching the 3D BAG (Mar 24) -> available in week 3
- 3: BIM processing with voxels (Apr 14) -> available in week 5

# Two exams (in person)

- Mid-term
    - Lessons 1.1 - 4.2
    - Mar 15
    - 5% of final mark
  - Final
    - All lessons
    - Apr 21 @ 9:00
    - 45% of final mark
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- Weighted average of 50% to pass the course

# Resits

- One resit for both exams together (50%)
- One resit per assignment (mostly likely redo of assignment with modified tasks)
- June 23 @ 9:00

# Course website

- No Brightspace!
- Everything is here: <https://3d.bk.tudelft.nl/courses/geo1004/>
- On Monday: check announcements/timetable to see if any information will be presented live

3d.bk.tudelft.nl/courses/geo1004/

Blogs ▾ Comics ▾ Entretenimiento ▾ Noticias ▾ Transporte ▾ TV ▾ Referencia ▾ Servicios ▾ Viajes ▾ Netatmo

GEO1004 about news lessons homework discord etc ▾

## 3D modelling of the built environment

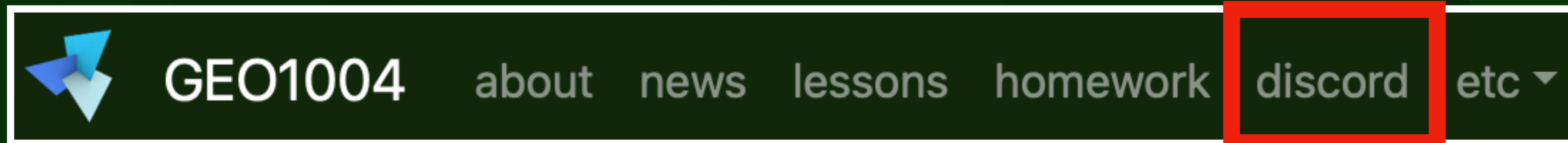
recent news

Feb 12 The course [Discord](#) and the first week of lessons are online. [Homework 0](#) has been updated.

week	monday 13:45	wednesday 13:45	other to dos
3.1 Feb 13 - Feb 17	A+BE Room D <a href="#">lesson 1.1 (dmds)</a> course and homework 0 intro	A+BE Room D <a href="#">lesson 1.2 (brep)</a> homework 1 intro	read <a href="#">about</a> page, do <a href="#">homework 0</a> (C++ preparation)

# Questions?

- In person during contact hours or Discord anytime:



- Don't hesitate to ask! General software/programming questions are fine too
- If possible, use geo1004 channel -> everyone can benefit from answers
- E-mail or Discord DM for personal matters

# Homework 0 intro



# What to do next?

## 1. Today:

- Homework 0 (install required software for C++ assignments)
- Go to [geo1004 website](#) and study today's lesson (video + 3D book chapter)
- If you have extra time, maybe start with Wednesday's lesson

## 2. Wednesday: intro to homework 1 and help with any questions about lessons or C++ installation

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