



**NTNU – Trondheim**  
Norwegian University of  
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Department of Geography

## **Examination paper for GEOG3524 – Raster Based GIS**

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<b>Examination time:</b>	<b>3 hours</b>
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<b>Language:</b>	<b>English</b>
<b>Number of pages:</b>	<b>2</b>
<b>Number of pages enclosed:</b>	<b>0</b>

There are 3 tasks for this exam. It is expected that you do them all. The tasks have different weights as indicated in brackets.

**Task 1: Concepts (30%)**

Explain briefly the following:

- a) Profile and plan curvature
- b) Georeferencing raster data
- c) Voronoi polygons and how they are used in natural neighbor interpolation

**Task 2: 3D Representation (30%)**

Concepts often used when describing 3D representations includes Digital Elevation Models (DEM), Digital Surface Models (DSM), Digital Terrain Models (DTM) and Triangular Irregular Networks (TIN).

- a) Explain these concepts and elaborate how they are different and how they overlap.
- b) Some claim that these sorts of representation are not truly 3D representation (they may be called 2.5D representations instead). Why are these representations not truly three dimensional?
- c) Vector representations (points, lines and polygon features) may represent a more truly 3D representation. How is this realized?

**Task 3: Urban flooding exposure (40%)**

Imagine you are working in a large urban municipality. The municipality has an increasing problem with urban flooding due to heavy precipitation, which is anticipated to increase in the future due to global warming. Your responsibility as heading the municipality's GIS section is to work out a plan for

- how your section will identifying areas particularly exposed to urban flooding and
- how the municipality may be better prepared for heavy precipitation events in the future.

Present here the main contents of this plan.