



**NEW ZEALAND  
GEOTECHNICAL  
SOCIETY INC**  
www.nzgs.org



# 2025 ONE-DAY SHORT COURSE INTRODUCTION TO GIS FOR GEOTECHNICAL PROFESSIONALS

**The NZ Geotechnical Society is offering a one-day short course providing an introduction to Geographic Information Systems (GIS) with a focus on geotechnical applications.**

All geotechnical investigations have significant spatial components and GIS software is an appropriate and powerful tool for bringing a range of data sources together to improve the understanding of ground conditions at all scales. Many governments have undertaken major investments in spatial technology to provide better access to information for the community, business and public sectors. There is now a large and growing range of spatial information available that is relevant to geotechnical applications, and it makes compelling business sense to have this capability in-house.

GIS is much more than just making maps (which it does very well) but also provides powerful tools for analysing large and diverse datasets. Software and hardware costs are no longer prohibitive, and professionals can run it even on personal machines.

## Aims of the Course

You will be introduced to GIS functionality, cover basic theory and work through a series of exercises with real geotechnical data to develop a geotechnical model. By the end of the day, each applicant will be able to open, create and recycle GIS projects, discover and import data, analyse relationships between data sets

and produce maps and topographic sections suitable for reports and presentations. What you don't complete can be taken home with you to continue your learning.

You will work with LiDAR, an exciting dataset that is revolutionising the understanding of landscapes and sites.

You will also learn where to get data, including online government repositories and how to link to web services that provides layers to add to your projects remotely, anywhere in the world.

The workshop will be interspersed with examples of real projects with opportunities for group discussion. Digital datasets and course notes will be provided.

Attendees will bring their own laptops with the powerful open source QGIS software preloaded and tested. Instructions will be provided to attendees before the course.

## Who should attend

Geotechnical practitioners with GIS skills are in increasing demand, so this could be your opportunity for professional development. Geotechnical practitioners (particularly engineers and geologists) at all levels of prior experience and training in GIS will benefit from the course,

especially those for whom this is new. For those managing GIS staff, there is much to be gained by learning more about what GIS and your GIS team can do for your business.

The course will also benefit those who are GIS analysts/specialists who do not have a geotechnical background; this is your opportunity to learn what your geotechnical colleagues really want to know. Communication with your geotechnical colleagues will be improved and some of the additional capabilities of GIS will be show cased, so that you can do more advanced and challenging tasks in the geotechnical space in the future.

## WHERE AND WHEN

**AUCKLAND**  
Tuesday 18<sup>th</sup> March  
Tonkin & Taylor  
1 Fanshawe St

**WELLINGTON**  
Monday 24<sup>th</sup> March  
Engineering New Zealand  
Level 6, 40 Taranaki Street

**CHRISTCHURCH**  
Thursday 27<sup>th</sup> March  
ENGEO  
124 Montreal Street

# SHORT COURSE: INTRODUCTION TO GIS FOR GEOTECHNICAL PROFESSIONALS

## Part 1 Preliminaries

## Part 2 Overview of the QGIS interface

**Part 3 GIS theory** including, projects, data, and thematic layers; datums and projections; accuracy and resolution

**Part 4 Geological/geotechnical data models:** drillholes, geology and geomorphology polygon layers, linears (faults, boundaries, lineaments), oriented data, samples, etc.

## Part 5 Data analysis and operations:

- Vector: queries and filters, table and spatial joins, geoprocessing
- Raster: queries and geoprocessing; DEM, DEM derivatives and DSM explained

## Part 6 Data sources (where to get it, and how to use it):

- External, local, shared, web services. Paper maps, aerial photographs, spreadsheets

## Part 7 The QGIS experience and class exercises

- Introduction to the QGIS interface followed by class exercises.

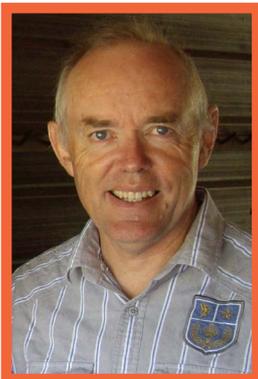
## Part 8 Advanced GIS

- Data management principles, managing photographs with geo-location, importing GPS data, going digital in the field, point clouds, interpolation methods

## COURSE PROGRAMME

(the times and sequence are indicative and may be changed on the day of the course)

<b>8:30 - 9:00am</b>	Setup
<b>9:00 - 9:10am</b>	Introductions
<b>9:10 - 10:15am</b>	Presentation: introducing GIS and basic principles
<b>10:15 - 10:30am</b>	Morning tea
<b>10:30 - 12:30pm</b>	Introducing QGIS and start of exercises
<b>12:30 - 1:00pm</b>	Lunch
<b>1:00- 3:00pm</b>	QGIS exercises continued
<b>3:00 - 3:15pm</b>	Afternoon Tea
<b>3:15 - 4:30pm</b>	QGIS exercises continued
<b>4:30 - 5:00pm</b>	Wrap up
<b>5:00pm</b>	Course concludes



## Presenter

The course will be led by Colin Mazengarb, a geologist residing in Hobart with 30 years GIS experience. Colin trained as a geologist at the University of Auckland, graduating with a MSc degree. He practiced as a regional geologist with the NZ Geological Survey (and successor organisations) for 20 years and a further 20

years as an engineering-geologist with Tasmania's geological survey (Mineral Resources Tasmania). Colin has provided this popular course over several years on behalf of the Australian Geomechanics Society and NZGS. While he has recently "retired", he continues to teach his GIS courses and undertakes hobby mapping including in the Gisborne region.

Colin and family lives in Hobart, Tasmania; enjoys among other things cycling, tennis, pickle ball and being a grandfather.



NEW ZEALAND  
GEOTECHNICAL  
SOCIETY INC

## REGISTRATION

### REGISTRATION FEES

**\$500 + GST for NZGS, NZSEE, SESOC and NZSOLD members (priority registration over non-members)**

**\$800 + GST for non-NZGS, NZSEE, SESOC and NZSOLD members.**

Registration fees include attendance of the course and course material (digital course notes) and full catering for the day (morning and afternoon teas, lunch tea and coffee). Fees will not be refunded if a participant is unable to attend, although a nominated substitute person may attend. If the course is cancelled fees will be refunded in full.

### TO REGISTER

<https://www.engineeringnz.org/courses-events/event-template/?eventtemplate=4172-introduction-to-gis-for-geoprosessionals&region=NZGS>

### COURSE NUMBERS

Number of attendees is limited. Registrations will be accepted on a first come – first served basis.