

COURSE DETAILS

Units of Credit	6		
Contact hours	Average 4 hours per week		
Class	Friday, 9 - 1pm	Room CE201	
Course Coordinator and Supervisor	Craig Roberts	email: c.roberts@unsw.edu.au	office: CE 412 phone: 9385 4464
Supervisor	Bruce Harvey	email:	

Linking the objectives with the program outcome attributes and the assessment strategies for this course:

Objectives	Program outcome attributes	Assessment
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is important that professional surveyors and engineers are able to assess their abilities and performance reliably.

The CE201 computer lab has been booked from 9am each Friday during Term 3 and a 4 hour timeslot has been set for the course so that extended field work can be carried out without clashing with other classes. Students should meet the supervisor at 9am in the lab each Friday (or online as advised) and describe their planned activities for the day. It is possible to do field or computer lab work on other days as well as the timetabled class.

The teaching strategies that will be used and their rationale.

Private Study	<ul style="list-style-type: none"> < Join Moodle/ BBCU discussions of problems < Reflect on class problems and assignments < Download materials from Moodle < Keep up with notices and find out marks via Moodle
Assessments	<ul style="list-style-type: none"> < Demonstrate your knowledge and skills < Demonstrate higher understanding and problem solving
Laboratory Work	<ul style="list-style-type: none"> < Hands-on group work, designing and carrying out surveys < Collaborative report writing

Some quotes that relate well to this course:

I hear and I forget. I see and I remember. I do and I understand.

By three methods we may learn wisdom: First, by reflection, which is noblest; second, by imitation, which is

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Due to Covid-19 restrictions, we will not be able to run this course as a camp. Instead, we will make regular day trip site visits on Fridays. It is anticipated that the entire task will take 1 day of reconnaissance and 2-3 days of planned field work to complete. The exact timing of these site visits will be determined by the group based on the scope of the work proposed by the group. A suggested timetable is given below. It is recommended for around 15 students.

Proposed tasks to be carried out at the camp*

- 1) Students will search for SCIMS control around the site.
- 2) Students will undertake a literature review of various documents relevant to the tasks such as: ICSM develop their survey design in concert with these documents.
- 3) Existing control will be assessed and new control will be proposed, established and measured in accordance with documentation above in part 2.
- 4) Measurement techniques such as static GNSS, NRTK, PPK, leap frog EDM height traver14605rH1(K)(P)-7(P)-0.000

Week 5: Field visit for control survey. Based on feedback from group report 1, make adjustments to the plan for the control survey and arrange all necessary unfinished logistics.

Week 6: Individual student interviews with supervisor. Process data from field work using Leica Infinity. Each group should individually produce a network adjusted set of numbers and compare with the original survey from 2019. Consider using FIXIT4 for comparison. Look at weaknesses in the network and improvements that could be made. Consider AUSPOS, PPK, virtual RINEX and repeat levelling runs. Prepare for follow-up field visit.

Week 7: Field visit for UAV/ airborne Lidar and extra survey work as required.

Week 8: Process UAV data and confirm the height of the output accords with AHD. Compute the LiDAR data set using Waypoint and confirm the height of the output accords with AHD. Download RTK data and cross reference with the UAV and LiDAR models. Combine all data sets (RTK, UAV, LiDAR) using Leica Infinity (or other suitable software). Determine how to best present the various datasets. Compare and contrast the various techniques graphically.

Week 9: Write up a group report detailing the various techniques. This group report will comprise various individual components allocated to individual students. Students will be assessed on their individual parts but all parts will combine into the group report. Discuss strengths and weaknesses, expected accuracy and precision and how it compares with the original survey. Give an assessment of which techniques are most suited to this environment and the confidence you have that marks are not moving or otherwise. Include WH & S documentation and time sheets. Write a short individual surveyors report of your opinion on how accurate researchers can monitor ongoing movement of the piezometers.

Week 10: Project write up, time sheets and self-assessment. Submission of group project report, individual cadastral assessment report and self-assessment for the whole course.

The reports should be in **electronic form** as a single MS Word format document that includes at least a title page, contents, summary, results, report, plans, input and output files. Spreadsheets, FIXIT4 input files, laser scan data, UAV files or Magnet Office/ Leica Infinity files where relevant can be in separate files. Name the files clearly. Field sheets (if applicable) and any other paper documents should be scanned for submission. The report should be professionally prepared for the client and copies may be given of the report or parts of it to people from WRL or even outside of UNSW.

Group reports are required for the first two assignments. Each group report however needs to include a breakdown of which individual student performed which task. This will be accompanied by a signed sheet from all group participants agreeing with their specific contribution to the final report. An individual self-assessment report is required.

PROJECT B: Urban Cadastral Survey (Supervisor: Bruce Harvey)

This cadastral project

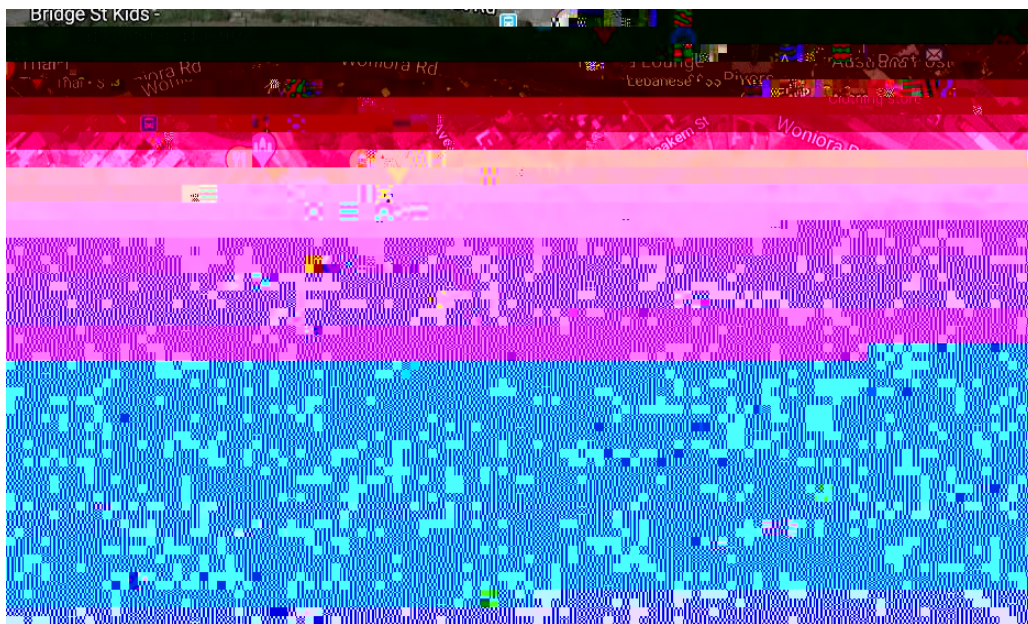
in those two courses are a prerequisite for this project.

This project will not include a residential field week, but will spend about one full day per week during term working on the project, in the office some days and in the field some days. Additional time will be spent by students preparing reports producing plans and analysis. A total of almost 150 hours is expected.

This project builds on considerable work done on this site by several thesis students in previous years and by some GMAT4150 students in 2019. We continue to work on this site because we have many DPs already purchased and much of the boundary dimensions are already in FIXIT input format.

The main site in 2020 is Rosebank Cres Hurstville, a loop formed with Woniora Road, and the lots enclosed within. It is very close to Hurstville Railway Station. It is the site of the DP used in GMAT3420 mid-term test

Neirbo Ave (eastern side) and Meakem St (southern side).



Depending on what we are allowed to do, the equipment we use will be: individuals using smart phones with GNSS apps; pairs of students using RTKGNSS; and or groups of three using total stations. The accuracies of the surveys will obviously differ but some of the cadastral boundary issues can still be learnt. We will survey road frontage boundaries, not the rear boundaries of lots.

Proposed Project Outcomes

- 1 Obtain MGA2020 coordinates of lot corners
- 2 which is based on the PSMA cadastral database.

- 3 Determine how close the old brick fences are to lot corners (offsets or joins). Determine the joins from unidentified survey marks to nearby lot corners.
- 4 Possibly, prepare a draft DP and LandXML file for the area surveyed. Understanding that the accuracy of our measurements may not meet NSW Regulations (because of the equipment we may have to use).
- 5 Prepare reports. Some group work and some individual work.

Proposed project Tasks

- 1) **Search.** Many Cadastral DPs that were collected for this site a few years ago will be supplied. Students will search to find if there are any new DPs or SPs (we will use base location plan only of any strata plans) for the site. Other information to be gathered includes: Google Earth; Nearmap; SIX maps; Google Street view; 1943 air photos; get MGA2020 coordinates of SCIMS marks; and Trove historical photos of the houses, fences and streets.

studying the collected information and preparing for the survey. If only a few students do that and you are not one of them then you w

correctly entered (

ASSESSMENT

There is no final examination in this course.

Details of each assessment component, the marks assigned to it, the criteria by which marks will be assigned, and the dates of submission are set out below for each project separately.

Each student should include a time sheet indicating the time spent on this course in much the same way as a business would use to charge a client for work on a project. It should include travel and meeting time. Students should not spend more than 150 hours on the course doing idle activities merely to accumulate time for the project. Students will be required to submit a formal documented self-assessment on their participation in this course. Students who spend too few hours on this

The main reason for including time sheets in the course is because some parts of industry report that some graduates are not experienced at recording total time spent on a project and the consequences for budgeting, and quoting for future projects.

Students are expected to have group meetings regularly and keep minutes and action items of those meetings. Students are to prepare all necessary H&S documentation and to submit this to their supervisor.

Feedback for all reports will be given as soon as possible after submission. Details of the Self-assessment task will be given in a separate file on the class website.

Late work will be penalised at the rate of 10% per day after the due time and date have expired.

Project A: Thirlmere Lakes control survey

Assessment Criteria for Project A are as follows:

Project team (group) report (30%)

- < Written presentation 5%
- < Literature Review 5%
- < Description of survey design, GNSS, vertical control, UAV and airborne Lidar 6%
- < Evidence of Initial field testing and analysis 8%
- < Project team working plan for Thirlmere Lakes project 6%

Final (individual) report and presentation (60%)

- < Written presentation 5

Project B: Urban Cadastral Survey

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RELEVANT RESOURCES

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DATES TO NOTE

