



## COURSE DETAILS

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|--|---|--------------------|--|
| <b>Units of Credit</b>                 | 6 UoC   |                    |  |
| <b>Contact hours</b>                   | 5 hours per week  |                    |  |
| <b>Class/Workshop</b>                  | Monday, 13:00 - 15:00<br>Tuesday, 13:00 - 15:00                                       | CLB5<br>CE G1      |  |
| <b>Field pracs</b>                     | Friday, 12:00 - 17:00   | CE G7 Survey Store |  |
| <b>Course Coordinator and Lecturer</b> | Dr Craig Roberts<br>email: c.roberts@unsw.edu.au<br>office: CE412<br>phone: 9385 4464 |                    |  |
| <b>Demonstrator</b>                    | Dr Yincai Zhou<br>email: y.zhou@unsw.edu.au<br>office: CE407                          |                    |  |

## INFORMATION ABOUT THE COURSE

This course is a part of a three-year program. Students should have already passed or been exempt from that course. If you have attempted but failed GMAT1110 then you should contact the course coordinator. This course also builds on GMAT2500 and GMAT2700. This course runs concurrently with GMAT2550 and some exercises have been structured to run concurrently. Elective GMAT3100 and GMAT3150 in third year will further extend this course.

Prerequisites: GMAT1110, GMAT2500, GMAT2700

Co requisite: MATH2019

## HANDBOOK DESCRIPTION

See link to virtual handbook:

[www.handbook.unsw.edu.au/undergraduate/courses/2022/GMAT2120.html](http://www.handbook.unsw.edu.au/undergraduate/courses/2022/GMAT2120.html)

## OBJECTIVES

The aim of the course is to study surveying instrumentation in depth, particularly precise digital levels, electronic total stations and electronic distance meters EDM.

This course will cover a detailed investigation of some contemporary terrestrial surveying instruments and their use. The course will commence with precise digital levelling (bar code) instruments covering design, accuracy, error sources, precise levelling techniques, errors and calibration. Then depth(T)-7(h)32(en)8( )4(e)8(l)8(e)8(ct)24 164.45 Tm0 g0 G[T]-7(h)

atmospheric parameters, coefficient of refraction, velocity corrections, geometric reductions, reductions of distances to the ellipsoid and analysis of errors will be exercised with a field prac exercise. At the conclusion of this course students gain an understanding of the impact specific field techniques and instrumentation have on the attainable precision when conducting terrestrial surveys.

During this course the following attributes will be exercised:

- Ø the skills involved in scholarly enquiry
- Ø an in-depth engagement with relevant disciplinary knowledge in its interdisciplinary context
- Ø the capacity for analytical and critical thinking and for creative problem solving
- Ø the ability to engage in independent and reflective learning
- Ø the skills to locate, evaluate and use relevant information (Information Literacy)
- Ø the capacity for enterprise, initiative and creativity
- Ø an appreciation of, and a responsiveness to change and the skills of effective communication

## **TEACHING STRATEGIES**

The original material for this course was prepared by the previous lecturer, A/Prof Jean5.2 841.92 reW\*nBT/F5 10.08 Tf1 0 0 1



## Practicals:

Each student will be a member of a group of 3 (or occasionally 2) students. Groups will be established during the first lecture and may change at the lecturer's discretion as the term progresses. Students are free to select their partners; however, students are advised to select their partners very carefully. Students that do not attend the first lecture, or cannot find a partner, will be put in a group by the lecturer. Get the address, mobile phone number, e-mail address, etc. of your group members immediately after the formation of the group. The joint (or individual) submissions for the practicals require considerable interaction between the students. Make sure that all field data are copied immediately after the fieldwork, so that all the students in the group have access to the data. Further information about the practicals will be distributed during the lectures and are available on the class web site. Rules for practicals are given below.

Some practicals require individual reports by the students, even if the fieldwork was shared (See instructions). Submissions are to be handed to the lecturer supervising the practical (or slip under their office door with appropriate title page) or emailed (see submission instructions) before the due date.

Reports must follow the instructions given in the handout "Submission of Reports". (A sample report is given on the course web site). Submissions must include a declaration on the authorship of the work. Each submission is to have a title page (title of assignment, date of submission, course code, course name, student number, name of student) and a summary of results page. Word processed submissions are not required but encouraged. Spreadsheets may be used for computations as long as they are designed by the student. This should also be emailed with an appropriate file name ie John\_Smith\_GMAT2120\_Prac 2.xls to aid organisation for the lecturer.

Each practical has instructions about computations and reporting. It is strongly recommended that student reports are written in the same sequence and with the same headings.

## ASSIGNMENTS

### Assessment Criteria for Field Practicals

*Comments:* Field practicals are a great opportunity to put theory into practice. Previous students have always rated field practicals very highly. Field practicals are group work (usually 3 per group) with either group or individual submissions (see details in separate prac exercises) usually 2 weeks after the exercise. As there is much to do in a short period of time, marks are deducted strictly for lateness. Field practicals are compulsory. Students must wear closed shoes or will be asked to leave and receive zero marks. This is a strict WHS requirement. Students are expected to rotate the work amongst themselves and will be encouraged to do this by prac supervisors.

*Marking scheme:* Depending on the exercise, marks will be allotted for clear and concise field notes, computations as per instructions, correctness of working, accuracy of observations, completion of all tasks, field sketches (where required), relevant comments or answers to specific questions asked in instructions and submission by allotted deadline. Details of individual assessment are contained in prac instructions for each prac available on Moodle.

*Penalties:* 1 day late = 10% mark lost, 2 days late = 20% marks lost etc. The lecturer reserves the right to deduct marks for poor participation during the practical exercise at their discretion.

*Feedback:* The prac supervisor will attempt to mark the prac exercise within 2 weeks of completion and return the marked exercise with annotations to the prac group/ individual. An overall report will be sent to all students with generic feedback for all and a class discussion in the lecture period will also take place to reinforce any issues that arose.

*Objectives and learning outcomes:* The student will learn about group work, time management, meeting time constraints, producing results in the field, logistics, field preparation, concise report writing and field note taking, producing results to tolerance despite conditions, working safely and in accordance with WHS.

### Assessment Criteria for Moodle levelling quiz

*Comments:* The levelling assignment replaces a former mid-session test. It is a moodle quiz designed to test your understanding of precise levelling after lectures, tutorials and a prac exercise.

*Marking scheme:* See moodle.

*Penalties:* See moodle.

*Feedback:* The lecturer is available for questions about the quiz.

*Objectives and learning outcomes:* The moodle levelling quiz is designed to reinforce the statistics and calculations involved in precise levelling. Student



## RELEVANT RESOURCES

**Lecture Material** (check the course website):

<http://moodle.telt.unsw.edu.au>

The Powerpoint lecture slides and other documents are available for download as PDF files at the course website.

Lectures can also be viewed as Echo/ BBCU recordings.

Text and Reference Books

**Text book:**

Uren, J & Price, WF. "Surveying for Engineers", 5th edition, 2010

(available in bookshop









