Description: Geodetic Surveying B

Subject | Cat-Nbr | Class | Term | Mode | Units | Campus
--------|---------|-------|------|------|-------|-------
SVY 3107 | 15181 | 2, 2002 | ONC | 1.00 |       | TWMBA

Academic Group: FOENS
Academic Org: FOES05
HECS Band: 2
ASCED Code: 031101

STAFFING
Examiner: Peter Gibbings
Moderator: Frank Young

PRE-REQUISITES
Pre-requisite: SVY 2105

RATIONALE
Geodesy is the science of measuring and representing the earth's surface, and the determination of a geometrical shape, size and mathematical model of the earth. Surveyors require a knowledge of the equipment and theoretical methods, used to determine geodetic coordinates using satellites and conventional methodology.

SYNOPSIS
The purpose of this course is to provide the student with an understanding of the principles involved in determining the size and shape of the earth, and from these data how geodetic position on the earth's surface can be obtained. It also looks at the part satellites play in position fixation and how to relate all geodetic measurements to the ground. Map projections are examined to demonstrate the presentation of geodetic data in a useable format. The course provides the student with the necessary knowledge and skills to plan and undertake GPS surveys.

OBJECTIVES
On completion of this course, students should be able to:

- define the elements of geometry of the ellipsoid and the geoid that are relevant to geodetic surveying, and illustrate these with the aid of suitable diagrams;
- calculate numerical values for these elements of geometry, with the aid of appropriate software, to the accuracy required for geodetic calculations;
• identify the vertical datum most commonly used in Australia and explain how gravity measurements are used to help define this surface;
• outline common types of map projections and illustrate their construction, properties and uses;
• reduce measured angles and distances, manually and with appropriate software, to a form suitable for use in geodetic calculations;
• explain the relationship between geographic coordinates of points, and the azimuth and spheroidal distance between these points;
• apply this knowledge to calculations of geodetic traverses, intersections and resections, using geographic coordinates;
• explain the relationship between UTM grid coordinates of points, and the grid bearing and grid distance between these points;
• apply this knowledge to calculations of geodetic traverses, intersections and resections, using UTM grid coordinates;
• understand the coordinate transformation process and transform three dimensional coordinates between systems and between datums, with the aid of suitable software, to the required level of accuracy;
• understand the fundamental principles of GPS and its surveying applications, data acquisition methodologies and accuracies;
• plan, observe, reduce, and adjust a GPS survey network in accordance with appropriate standards, specifications and recommended practices.

**TOPICS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Weighting (%)</th>
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</thead>
<tbody>
<tr>
<td>1. Ellipsoids and datums</td>
<td>3.00</td>
</tr>
<tr>
<td>2. Gravity and vertical datums</td>
<td>7.00</td>
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<tr>
<td>3. Map projections</td>
<td>3.00</td>
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<tr>
<td>4. Measuring on the earth's surface</td>
<td>11.00</td>
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<tr>
<td>5. Computations on the spheroid</td>
<td>17.00</td>
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<td>6. UTM grid coordinates</td>
<td>17.00</td>
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<td>7. Coordinate transformations</td>
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<tr>
<td>8. GPS Basics</td>
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<td>9. Design of GPS surveys</td>
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<td>10. Reduction and adjustment of GPS surveys</td>
<td>5.00</td>
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<tr>
<td>11. Specifications and recommended practices</td>
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**TEXT and MATERIALS required to be PURCHASED or ACCESSED:**

Books can be ordered by fax or telephone. For costs and further details use the 'Book Search' facility at http://bookshop.usq.edu.au by entering the author or title of the text.

*SVY3107 Geodetic Surveying B External Study Package*, USQ Publication,
REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Access to MS Excel will greatly assist with completion of assessments 1 and 2.
Access to the Internet is required as several useful URL's are noted throughout the study materials.
Other references are provided in the SVY3107 Geodetic Surveying B, Study Book.

STUDENT WORKLOAD REQUIREMENTS

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>HOURS</th>
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<tbody>
<tr>
<td>Assessment</td>
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<tr>
<td>Examinations</td>
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<tr>
<td>Lectures</td>
<td>24</td>
</tr>
<tr>
<td>Private Study</td>
<td>54</td>
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<td>Tutorial</td>
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ASSESSMENT DETAILS

<table>
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<tr>
<th>Description</th>
<th>Marks Out of</th>
<th>Wtg(%)</th>
<th>Required</th>
<th>Due Date</th>
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<tbody>
<tr>
<td>ASSIGNMENT 1</td>
<td>200.00</td>
<td>20.00</td>
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<td>02 Sep 2002</td>
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<tr>
<td>ASSIGNMENT 2</td>
<td>200.00</td>
<td>20.00</td>
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<td>11 Oct 2002</td>
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<td>3 HOUR CLOSED EXAMINATION</td>
<td>600.00</td>
<td>60.00</td>
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NOTES:
3. Student Administration will advise students of the dates of their examinations during the semester.

OTHER REQUIREMENTS

1. To receive a passing grade in this course a student must normally achieve at least 45% in each of the assessments and at least 50% of the available marks for the course.
A minimum standard of communication skills must be demonstrated in order for a passing grade to be achieved.

The due date for an assignment is the date by which a student must submit the assignment to the USQ. The onus is on the student to provide proof of the submit date, if requested by the Examiner.

Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

In accordance with University's Assignment Extension Policy (Regulation 5.6.1), the examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.

If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks for the assignment will apply for each working day late.

In the event that a due date for an assignment falls on a local public holiday in their area, such as a Show holiday, the due date for the assignment will be the next day. Students are to note on the assignment cover the date of the public holiday for the Examiner's convenience.

The Faculty of Engineering and Surveying will NOT accept submission of handwritten or typed assignments by facsimile, e-mail or computer diskette. Students in remote locations who do not have regular access to postal services may be given special consideration.

It is the students' responsibility to actively participate in all classes scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration.

The final grades for students will be assigned on the basis of the aggregate of the marks obtained for each of the assessments in the course.

The final examination in this course is closed and will contain descriptive type questions and essay questions.

A closed examination is an examination where the candidates are allowed to bring only writing and drawing instruments into the examination.

The Faculty of Engineering and Surveying does not offer supplementary examinations.

Students who have undertaken all of the required assessments in a course but who have failed to meet some of the specified objectives of a course within the normally prescribed time may be awarded the temporary grade: IM (Incomplete - Make up). An IM grade will only be awarded when, in the opinion of the examiner, a student will be able to achieve the remaining objectives of the course after a period of non-directed personal study.

Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination; IDM (Incomplete Deferred Make-up; IDSM (Incomplete Deferred Examination and Make-up).