



The University of Southern Queensland

Course specification

Description: Introduction to Global Positioning System

| Subject | Cat-nbr | Class | Term | Mode | Units | Campus |
|---------|---------|-------|---------|------|-------|-----------|
| SVY | 1110 | 45259 | 2, 2005 | EXT | 1.00 | Toowoomba |

| | |
|-----------------------------------|--------|
| Academic group: | FOENS |
| Academic org: | FOES05 |
| Student contribution band: | 2 |
| ASCED code: | 031101 |

STAFFING

Examiner: Peter Gibbings

Moderator: Glenn Campbell

RATIONALE

Throughout the centuries, people have sought a simple way of determining where they are on Earth, and where they are heading. Positioning and navigation have always been one of the most basic problems facing civilisation. Today GPS has provided us with the ability to know where we are and where we are heading. GPS provides this worldwide navigation service by using a constellation of satellites orbiting the Earth. It is essential that surveyors, GIS specialists, and other casual users be familiar with the fundamentals of GPS and that they have a sound understanding of its uses, and the accuracy achievable by different GPS observation and reduction techniques.

SYNOPSIS

The use of the Global Positioning System (GPS), for accurately determining positions on earth, has grown exponentially since the late 1980s and early 1990s. Today GPS is firmly entrenched in the general operations of professional surveying and GIS organisations. This course presents fundamental information on structure, characteristics and use of GPS and other Global Navigation Satellite Systems (GNSS). Background information is provided and the basic principles of using the GNSS systems are introduced. The course has a bias towards the code observable and the use of GPS for asset mapping, but several sections dealing with higher accuracy measurement techniques make this course relevant to a wide range of students. Consequently, the information will be relevant to those seeking fundamental knowledge in areas of general GPS surveying, agriculture, machine guidance, mapping and general data collection.

OBJECTIVES

On completion of this course students will be able to:

1. explain why GPS is important in society today and identify uses of GPS;
2. define coordinates systems likely to be encountered by GPS users;
3. describe global satellite navigation systems, satellite orbital characteristics, and satellite signal structure;

4. define the characteristics of GPS and outline its development;
5. discuss the principles of GPS observations;
6. explain GPS observations techniques and associated accuracies;
7. demonstrate an understanding of error sources in GPS observations;
8. discuss the key steps in planning a GPS data collection project for asset mapping;
9. explain GPS data acquisition and processing techniques;
10. describe the use of GPS for asset mapping, and other common uses.

TOPICS

| | Description | Weighting (%) |
|----|--------------------------------------|---------------|
| 1. | Introduction | 5.00 |
| 2. | GPS Coordinates | 10.00 |
| 3. | GPS Fundamentals | 15.00 |
| 4. | Code observable | 15.00 |
| 5. | Differential GPS | 15.00 |
| 6. | Phase observable | 10.00 |
| 7. | Project Planning | 10.00 |
| 8. | Collection and Processing | 10.00 |
| 9. | Asset Mapping and other Applications | 10.00 |

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

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.

STUDENT WORKLOAD REQUIREMENTS

| ACTIVITY | HOURS |
|----------------|-------|
| Assessment | 30.00 |
| Directed Study | 48.00 |
| Examinations | 3.00 |
| Private Study | 74.00 |

ASSESSMENT DETAILS

| Description | Marks out of | Wtg(%) | Due date |
|---------------------------|--------------|--------|-------------|
| ASSIGNMENT 1 | 200.00 | 20.00 | 12 Sep 2005 |
| 3 HOUR CLOSED EXAMINATION | 800.00 | 80.00 | END S2 |

IMPORTANT ASSESSMENT INFORMATION

- Attendance requirements:**
There are no attendance requirements for this course. However, it is the students' responsibility 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.
- Requirements for students to complete each assessment item satisfactorily:**
To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available (or at least a grade C-) for each assessment item.
- Penalties for late submission of required work:**
If students submit assessments after the due date without prior approval then a penalty of 20% of the total marks available for the assignment will apply for each working day late.
- Requirements for student to be awarded a passing grade in the course:**
To be assured for receiving a passing grade a student must achieve at least 50% in each of the summative assessments and at least 50% of the available weighted marks for the summative assessment items.
- Method used to combine assessment results to attain final grade:**
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.
- Examination information:**
In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.
- Examination period when Deferred/Supplementary examinations will be held:**
Any Deferred or Supplementary examinations for this course will be held during the examination period at the end of the semester of the next offering of this course.
- University Regulations:**
Students should read USQ Regulations 5.1 Definitions, 5.6 Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL: <http://www.usq.edu.au/SECARIAT/calendar/Part5/> or on USQ online handbook.

ASSESSMENT NOTES

- The due date for an assignment is the date by which a student must despatch the assignment to USQ. The onus is on the student to provide proof of the dispatch date, if requested by the Examiner.
- Students must retain a copy of each item submitted for assessment. This must be despatched to USQ within 24 hours if required by the Examiner.

- 3 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.
- 4 The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media.
- 5 The Faculty will NOT accept submission of assignments by facsimile.
- 6 Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the Examiner of the course to negotiate such special arrangements.
- 7 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.
- 8 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 one of the temporary grades: IM (Incomplete - Make up), IS (Incomplete - Supplementary Examination) or ISM (Incomplete - Supplementary Examination and Make up). A temporary 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.
- 9 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. The following temporary grade may be awarded: IDM (Incomplete Deferred Make up).

OTHER REQUIREMENTS

- 1 Students will require access to e-mail and internet access to USQ Connect for this course.
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