Unit Outline
12454 Gravity and Magnetics for Exploration 301
Semester 1, 2013

Unit study package number: 12454
Mode of study: Internal
Tuition pattern summary: Lecture: 1 x 2 Hours Weekly
Computer Laboratory: 1 x 3 Hours Weekly
This unit does not have a fieldwork component.
Credit Value: 25.0
Pre-requisite units: 7032 (v.0) Geology 102 or any previous version
AND
8127 (v.0) Advanced Calculus 201 or any previous version
OR
8648 (v.0) Mathematical Methods 201 or any previous version
AND
8128 (v.0) Linear Algebra 202 or any previous version
OR
7905 (v.0) Mathematical Methods 202 or any previous version
AND
302455 (v.0) Introduction to Geophysical Mineral Exploration Methods 245 or any previous version
Co-requisite units: Nil
Anti-requisite units: Nil
Result type: Grade/Mark
Approved incidental fees: Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.
Unit coordinator: Name: Brett Harris
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Building: 613
Room: 431
Teaching Staff: Name: Paul Wilkes
Email: P.Wilkes@curtin.edu.au
Building: 301
Administrative contact: Name: Judith Tournay
Phone: +618 9266 3565
Email: J.Tournay@curtin.edu.au
Building: 613
Room: 4H02
Learning Management System: Blackboard (lms.curtin.edu.au)
Acknowledgement of Country
We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus
Theory of magnetic and gravity fields and their uses in geophysical applications. These include mineral and hydrocarbon exploration, engineering and environmental applications. Computer processing. Interpretation techniques including modelling and inversion techniques. Survey design. Practical field experience.

Introduction
Theory and applications of magnetic and gravity methods and their geophysical applications in exploration and environmental use. Computer processing to provide examples and experience to supplement the theory part of the course.

Learning Outcomes
On successful completion of this unit students can:

<table>
<thead>
<tr>
<th></th>
<th>On successful completion of this unit students can:</th>
<th>Graduate Attributes addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Apply magnetic and gravity theory to the analysis of ground and airborne survey data</td>
<td></td>
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<tr>
<td>2</td>
<td>Design, execute and analyse airborne, ground magnetic and gravity surveys</td>
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<td>3</td>
<td>Explain magnetic and gravity data processing techniques</td>
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<td>4</td>
<td>Analyse and explain magnetic and gravity datasets</td>
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<tr>
<td>5</td>
<td>Describe current and future research trends within geophysics fields</td>
<td></td>
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Curtin’s Graduate Attributes

<table>
<thead>
<tr>
<th></th>
<th>Apply discipline knowledge</th>
<th>Thinking skills (use analytical skills to solve problems)</th>
<th>Information skills (confidence to investigate new ideas)</th>
<th>Communication skills</th>
<th>Technology skills</th>
<th>Learning how to learn (apply principles learnt to new situations) (confidence to tackle unfamiliar problems)</th>
<th>International perspective (value the perspectives of others)</th>
<th>Cultural understanding (value the perspectives of others)</th>
<th>Professional Skills (work independently and as a team) (plan own work)</th>
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<tbody>
<tr>
<td></td>
<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<td>✓</td>
<td></td>
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</tbody>
</table>

Find out more about Curtin’s Graduate attributes at the Office of Teaching & Learning website: otl.curtin.edu.au

Learning Activities
no changes required

Learning Resources

Essential Texts
The required textbook(s) for this unit are:

- Looking into the Earth, Mussett and Khan, Cambridge University Press, 2000
### Assessment

#### Assessment Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>20 percent</td>
<td>Week: 4 Day: Friday</td>
<td>1,3,4</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>20 percent</td>
<td>Week: 10 Day: Friday</td>
<td>1,2,3,4,5</td>
</tr>
<tr>
<td>Laboratory Book</td>
<td>20 percent</td>
<td>Week: 13 Day: Friday</td>
<td>1,2,3,4,5</td>
</tr>
<tr>
<td>End of semester examination</td>
<td>40 percent</td>
<td>TBA</td>
<td>1,2,3,4,5</td>
</tr>
</tbody>
</table>

#### Detailed information on assessment tasks

1. assignment 1
2. assignment 2
3. workbook
4. examination

#### Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment Manual, available from [policies.curtin.edu.au/policies/teachingandlearning.cfm](policies.curtin.edu.au/policies/teachingandlearning.cfm)

#### Late Assessment Policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments which students are required to submit will have a due date and time specified on the Unit Outline.
2. Accepting late submission of assignments or other work will be determined by the unit coordinator or Head of School and will be specified on the Unit Outline.
3. If late submission of assignments or other work is not accepted, students will receive a penalty of 100% after the due date and time ie a zero mark for the late assessment.
4. If late submission of assignments or other work is accepted, students will be penalised by ten percent per calendar day for a late assessment submission (eg a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assignment worth 20 will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and marked as 12/20, the student would receive 6/20. An assessment more than seven calendar days overdue will not be marked. Work submitted after this time (due date plus seven days) may result in a Fail - Incomplete (F-IN) grade being awarded for the unit.

#### Pass requirements

50 percent

#### Referencing style

Students should use the SEG referencing style when preparing assignments.

More information on this referencing style can be obtained at [http://www.seg.org/resources/publications/books/bookinstructionstoauthors](http://www.seg.org/resources/publications/books/bookinstructionstoauthors)
Plagiarism
Plagiarism occurs when work or property of another person is presented as one's own, without appropriate acknowledgement or referencing. Plagiarism is a serious offence. For more information refer to academicintegrity.curtin.edu.au.

Plagiarism Monitoring
Work submitted may be subjected to a plagiarism detection process, which may include the use of systems such as ‘Turnitin’. For further information, see academicintegrity.curtin.edu.au/students/turnitin.cfm.

Additional information
Enrolment:
It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Supplementary/Deferred Exams:
Supplementary and deferred examinations will be held at a date to be advised. Notification to students will be made after the Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS. It is the student's responsibility to check their OASIS account on a weekly basis for official Curtin correspondence. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details.

Student Rights and Responsibilities
It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University's Guiding Ethical Principles
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all these things is available through the University's “Student Rights and Responsibilities website at: students.curtin.edu.au/rights.

Disability
Students with a disability or medical condition (e.g. mental health condition, chronic illness, physical or sensory disability, learning disability) are encouraged to seek advice from Disability Services www.disability.curtin.edu.au. A Disability Advisor will work with you and liaise with staff to identify strategies to assist you to meet unit (including fieldwork education) and course requirements, where possible. It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances.

Recent unit changes
We welcome feedback as one way to keep improving this unit. Students are encouraged to provide unit feedback through eVALUate, Curtin's online student feedback system (see evaluate.curtin.edu.au/info). Recent changes to this unit include:

No changes

See evaluate.curtin.edu.au to find out when you can eVALUate this unit.
<table>
<thead>
<tr>
<th>Week</th>
<th>Begin Date</th>
<th>Lecture/ Seminar</th>
<th>Pre-readings</th>
<th>Tutorial/Other</th>
<th>Assessment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation</td>
<td>25 February</td>
<td></td>
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<tr>
<td>1.</td>
<td>4 March</td>
<td>intro to magnetics</td>
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<td>2.</td>
<td>11 March</td>
<td>aeromagnetic processing</td>
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<td>3.</td>
<td>18 March</td>
<td>intro to gravity</td>
<td></td>
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<tr>
<td>4.</td>
<td>25 March</td>
<td>gravity processing</td>
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<td>assignment 1</td>
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<td>5.</td>
<td>1 April</td>
<td>Tuition Free Week</td>
<td></td>
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<td>6.</td>
<td>8 April</td>
<td>magnetism and remanence</td>
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<td>7.</td>
<td>15 April</td>
<td>gravity terrain corrections</td>
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<td>8.</td>
<td>22 April</td>
<td>Tuition Free Week</td>
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<td>9.</td>
<td>29 April</td>
<td>gravity gradiometry</td>
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<td>10.</td>
<td>6 May</td>
<td>euler deconvolution</td>
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<td>assignment 2</td>
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<tr>
<td>11.</td>
<td>13 May</td>
<td>research topics 1</td>
<td></td>
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<tr>
<td>12.</td>
<td>20 May</td>
<td>research topics 2</td>
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<td>13.</td>
<td>27 May</td>
<td>research topics 3</td>
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<tr>
<td>14.</td>
<td>3 June</td>
<td>semester review</td>
<td></td>
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<td>workbook</td>
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<tr>
<td>15.</td>
<td>10 June</td>
<td>Study Week</td>
<td></td>
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<td>16.</td>
<td>17 June</td>
<td>Examinations</td>
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<tr>
<td>17.</td>
<td>24 June</td>
<td>Examinations</td>
<td></td>
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