Unit Outline
GEOP4001 Advanced Electromagnetic and Potential Field Methods in Geophysics
Semester 1, 2015

Unit study package code: GEOP4001
Mode of study: Internal

Tuition pattern summary: Note: For any specific variations to this tuition pattern and for precise information refer to the Learning Activities section.
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: 10364 (v.0) Resistivity and Induced Polarisation Exploration Methods 605 or any previous version
OR
12456 (v.0) Resistivity and Induced Polarisation Exploration Methods 305 or any previous version
OR
GEOP6002 (v.0) Resistivity and Induced Polarisation Exploration Methods or any previous version
OR
GEOP3002 (v.0) Resistivity and Induced Polarisation Exploration Methods 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.

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Acknowledgement of Country
We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus

Introduction
Electromagnetic and potential field methods provide geophysical tools that are routinely applied for a broad range of exploration problems. The theory, applications and equipment design required for these methods are developed with examples.

Unit Learning Outcomes
All graduates of Curtin University achieve a set of nine graduate attributes during their course of study. These tell an employer that, through your studies, you have acquired discipline knowledge and a range of other skills and attributes which employers say would be useful in a professional setting. Each unit in your course addresses the graduate attributes through a clearly identified set of learning outcomes. They form a vital part in the process referred to as assurance of learning. The learning outcomes tell you what you are expected to know, understand or be able to do in order to be successful in this unit. Each assessment for this unit is carefully designed to test your achievement of one or more of the unit learning outcomes. On successfully completing all of the assessments you will have achieved all of these learning outcomes.

Your course has been designed so that on graduating we can say you will have achieved all of Curtin’s Graduate Attributes through the assurance of learning process in each unit.

<table>
<thead>
<tr>
<th>On successful completion of this unit students can:</th>
<th>Graduate Attributes addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Evaluate a range of geophysical techniques applicable for geophysical exploration</td>
<td>![Graduate Attribute Icon] ![Graduate Attribute Icon] ![Graduate Attribute Icon]</td>
</tr>
<tr>
<td>2 Interpret electromagnetic datasets</td>
<td>![Graduate Attribute Icon] ![Graduate Attribute Icon] ![Graduate Attribute Icon]</td>
</tr>
<tr>
<td>3 Explain electromagnetics field propagation in the earth</td>
<td>![Graduate Attribute Icon] ![Graduate Attribute Icon] ![Graduate Attribute Icon]</td>
</tr>
<tr>
<td>4 Verify solutions using industry-standard geophysical software</td>
<td>![Graduate Attribute Icon] ![Graduate Attribute Icon] ![Graduate Attribute Icon]</td>
</tr>
</tbody>
</table>

Curtin’s Graduate Attributes

- Apply discipline knowledge
- Communication skills
- International perspective
- Thinking skills
- Technology skills
- Cultural understanding
- Information skills
- Learning how to learn
- Professional Skills
- Confidence to investigate new ideas
- Confidence to tackle unfamiliar problems
- Work independently and as a team
- Apply principles learnt to new situations
- Plan own work
- Value the perspectives of others

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

Learning Activities
Learning activities focus on combining lectures with (i) application of computer modelling with advanced EM/potential field software plus (ii) demonstrations of field techniques along with (iii) exploration of the inner workings of modern EM equipment.
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>Mid semester test</td>
<td>20 percent</td>
<td>Week: 8, Day: Wednesday, Time: 12 pm</td>
<td>1,5</td>
</tr>
<tr>
<td>Portfolio</td>
<td>60 percent</td>
<td>Week: 13, Day: Wednesday, Time: 12 pm</td>
<td>5,3,2</td>
</tr>
<tr>
<td>Test</td>
<td>20 percent</td>
<td>Week: 14, Day: Wednesday, Time: 12 am</td>
<td>1,5,2</td>
</tr>
</tbody>
</table>

Detailed information on assessment tasks

1. Mid Semester Test
2. End of semester test
3. Portfolio

Pass requirements

Students must receive an overall pass grade in this unit.

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 and Student Progression Manual, available from 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 students are required to submit will have a due date and time specified on this Unit Outline.
2. Students will be penalised by a deduction of ten percent per calendar day for a late assessment submission (e.g., 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 assessment worth 20 marks will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and given a mark of 16/20, the student would receive 10/20. An assessment more than seven calendar days overdue will not be marked and will receive a mark of 0.

Assessment extension

A student unable to complete an assessment task by/on the original published date/time (e.g., examinations, tests) or due date/time (e.g., assignments) must apply for an assessment extension using the Assessment Extension form (available from students.curtin.edu.au/administration/) as prescribed by the Academic Registrar. It is the responsibility of the student to demonstrate and provide evidence for exceptional circumstances beyond the student's control that prevent them from completing/submitting the assessment task.

The student will be expected to lodge the form and supporting documentation with the unit coordinator before the assessment date/time or due date/time. An application may be accepted up to five working days after the date or due date of the assessment task where the student is able to provide an acceptable explanation as to why he or she was not able to submit the application prior to the assessment date. An application for an assessment extension will not be accepted after the date of the Board of Examiners' meeting.

Deferred assessments

If your results show that you have been granted a deferred assessment you should immediately check your OASIS email for details.
Deferred examinations/tests will be held from 16/07/2015 to 17/07/2015. Notification to students will be made after the Board of Examiners’ meeting via the Official Communications Channel (OCC) in OASIS.

**Supplementary assessments**

Supplementary assessments are not available in this unit.

**Referencing style**

The referencing style for this unit is SEG.

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)

**Academic Integrity (including plagiarism and cheating)**

Any conduct by a student that is dishonest or unfair in connection with any academic work is considered to be academic misconduct. Plagiarism and cheating are serious offences that will be investigated and may result in penalties such as reduced or zero grades, annulled units or even termination from the course.

Plagiarism occurs when work or property of another person is presented as one’s own, without appropriate acknowledgement or referencing. Submitting work which has been produced by someone else (e.g. allowing or contracting another person to do the work for which you claim authorship) is also plagiarism. Submitted work is subjected to a plagiarism detection process, which may include the use of text matching systems or interviews with students to determine authorship.

Cheating includes (but is not limited to) asking or paying someone to complete an assessment task for you or any use of unauthorised materials or assistance during an examination or test.

For more information, including student guidelines for avoiding plagiarism, refer to the Academic Integrity tab in Blackboard or [academicintegrity.curtin.edu.au](http://academicintegrity.curtin.edu.au).

**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.

**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](http://students.curtin.edu.au/rights)."
Student Equity

There are a number of factors that might disadvantage some students from participating in their studies or assessments to the best of their ability, under standard conditions. These factors may include a disability or medical condition (e.g. mental illness, chronic illness, physical or sensory disability, learning disability), significant family responsibilities, pregnancy, religious practices, living in a remote location or another reason. If you believe you may be unfairly disadvantaged on these or other grounds please contact Student Equity at eesj@curtin.edu.au or go to http://eesj.curtin.edu.au/student_equity/index.cfm for more information.

You can also contact Counselling and Disability services: http://www.disability.curtin.edu.au or the Multi-faith services: http://life.curtin.edu.au/health-and-wellbeing/about_multifaith_services.htm for further information.

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 so please get in touch with the appropriate service if you require assistance. For general wellbeing concerns or advice please contact Curtin’s Student Wellbeing Advisory Service at:


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/).

To view previous student feedback about this unit, search for the Unit Summary Report at evaluate.curtin.edu.au/student/unit_search.cfm. See evaluate.curtin.edu.au to find out when you can eVALUate this unit.

Recent changes to this unit include:

No change
<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>23 February</td>
<td>Orientation Week</td>
<td></td>
<td></td>
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<tr>
<td>1.</td>
<td>2 March</td>
<td>EM application &amp; theory I</td>
<td></td>
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<td>2.</td>
<td>9 March</td>
<td>EM application &amp; theory II</td>
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<td>3.</td>
<td>16 March</td>
<td>EM application &amp; theory III</td>
<td>(Magnetotellurics)</td>
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<td>4.</td>
<td>23 March</td>
<td>EM application &amp; theory IV</td>
<td>(Marine EM)</td>
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<tr>
<td>5.</td>
<td>30 March</td>
<td>EM application &amp; theory V</td>
<td>(Airborne EM)</td>
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<tr>
<td>6.</td>
<td>6 April</td>
<td>Tuition Free Week</td>
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<tr>
<td>7.</td>
<td>13 April</td>
<td>Tuition Free Week</td>
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<tr>
<td>8.</td>
<td>20 April</td>
<td>EM acquisition &amp; instrumentation I</td>
<td></td>
<td></td>
<td>TEST 1</td>
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<tr>
<td>9.</td>
<td>27 April</td>
<td>EM acquisition &amp; instrumentation II</td>
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<tr>
<td>10.</td>
<td>4 May</td>
<td>EM acquisition &amp; instrumentation III</td>
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<tr>
<td>11.</td>
<td>11 May</td>
<td>EM acquisition and instrumentation IV</td>
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<tr>
<td>12.</td>
<td>18 May</td>
<td>EM &amp; Potential Fields in exploration</td>
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<tr>
<td>13.</td>
<td>25 May</td>
<td>Potential Fields Software Review</td>
<td></td>
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<td>TEST II</td>
</tr>
<tr>
<td>14.</td>
<td>1 June</td>
<td>Revision</td>
<td></td>
<td></td>
<td>Portfolio</td>
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<tr>
<td>15.</td>
<td>8 June</td>
<td>Study Week</td>
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<td>16.</td>
<td>15 June</td>
<td>Examinations</td>
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<tr>
<td>17.</td>
<td>22 June</td>
<td>Examinations</td>
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</tbody>
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Order of lectures and labs may change to accommodate equipment and expert lecturer availability.