



# Course Outline (Higher Education)

<b>School:</b>	School of Engineering, Information Technology and Physical Sciences
<b>Course Title:</b>	APPLIED GEOPHYSICS
<b>Course ID:</b>	SCGEO3106
<b>Credit Points:</b>	15.00
<b>Prerequisite(s):</b>	(SCGEO1103)
<b>Co-requisite(s):</b>	Nil
<b>Exclusion(s):</b>	(SX728)
<b>ASCED:</b>	010705

## Description of the Course :

This course details key geophysical exploration methods, as well as their costs, relevance and real world application. Students will collect geophysical data in the field, and interpret geophysical data from a range of techniques. This course prepares students for roles in the exploration/mining/consulting industries which utilise/rely on geophysical data.

**Grade Scheme:** Graded (HD, D, C, etc.)

## Work Experience:

No work experience: Student is not undertaking work experience in industry.

**Placement Component:** No

**Supplementary Assessment:** Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

## Program Level:

Level of course in Program	AQF Level of Program					
	5	6	7	8	9	10
Introductory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Learning Outcomes:**

This course provides students with insight into the key geophysical exploration methods, as well as their costs, relevance and real world application. Students will collect geophysical data in the field, and interpret geophysical data from a range of techniques, including , but not limited to, gravity, magnetics, electrical techniques, electro-magnetics, and seismic techniques. On completion of the course, students will be able to:

**Knowledge:**

- K1.** Explain the key concepts and principles of geophysical exploration
- K2.** Compare and contrast the physical properties of Earth materials as they relate to geophysical interpretation.
- K3.** Determine the appropriate geophysical exploration techniques for a given natural resource exploration program or environmental investigation.
- K4.** Explain the value and limitations of the application of geophysical techniques in geological interpretation of the Earth.
- K5.** Contrast the economic and logistical limitations of various geophysical techniques.

**Skills:**

- S1.** Appraise and select geophysical techniques for natural resource exploration programs and environmental applications..
- S2.** Apply practical field data collection procedures.
- S3.** Analyse and interpret geophysical data.

**Application of knowledge and skills:**

- A1.** Analyse geophysical data sets to assist in interpreting geology
- A2.** Select appropriate geophysical exploration techniques for a range of settings
- A3.** Provide advice on the selection of geophysical techniques
- A4.** Communicate complex geophysical concepts to a range of audiences

**Course Content:**

The course is core in the Geology stream of the Bachelor of Applied Science. Other students may elect this course to provide a background for a career in the environmental geosciences or environmental engineering industries.

Topics may include:

- Gravity Methods
- Resistivity Methods
- Magnetic Method
- Electromagnetic Method
- Radiometrics and geochronology
- Induced Polarisation Method
- Seismic Methods
- Wireline techniques

**Values:**

- V1.** Appreciate the role of geophysical investigations in applied geology and engineering.
- V2.** Explain the importance of professional standards of conduct.

**V3.** Describe the value of geophysical data in interpreting geology

### Graduate Attributes

The Federation University FedUni graduate attributes (GA) are entrenched in the Higher Education Graduate Attributes Policy (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course			
		Learning Outcomes (KSA)	Code A. Direct B. Indirect N/A Not addressed	Assessment task (AT#)	Code A. Certain B. Likely C. Possible N/A Not likely
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K2, K3, K4, K5, S1, S3, A1, A2, A3	A	1, 3	A
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	Not applicable	Not applicable	Not applicable	Not applicable
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	K2, K4, S2, S3, A1	B	3	B
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	K1, K2, K3, K4, K5, S1, A4	A	2	B
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable	Not applicable	Not applicable

### Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K2, K4, K5, S2, S3, A1, A4	Practical Assignments	Written reports addressing basic concepts and technical problem solving.	20-35%
K1, K3, K4, S1, A3, A4, V3	Research Assignment on published geophysical studies	Presentation	10-20%
K2, K3, S1, S2, S3, A1, A2, A3, V2, V3	Producing and interpreting geophysical data	Report	10-15%

<b>Learning Outcomes Assessed</b>	<b>Learning Tasks</b>	<b>Assessment Type</b>	<b>Weighting</b>
K1-K5, S1, S3, A1, A2, A3, A4, V3	End of Semester Test(s)	Theory test to assess student understanding of key concepts	45-60%

**Adopted Reference Style:**

Australian Harvard