Course Outline (Higher Education)

School: School of Science, Engineering and Information Technology

Course Title: SOILS AND WEATHERING: REGOLITH SCIENCE

Course ID: SCGEO3112

Credit Points: 15.00

Prerequisite(s): SCENV1502

Co-requisite(s): Nil

Exclusion(s): (SCGEO2101)

ASCED Code: 010703

Description of the Course :

The regolith is the blanket of largely unconsolidated Earth materials at the Earth`s surface that overlies fresh rock. It is where most of the planet`s terrestrial bioproductivity takes place, contains important mineral resources such as aluminium, heavy minerals and industrial minerals, and holds clues to the location of buried ore deposits. The course addresses the description and classification of the regolith, with a focus on soils, the processes that form and modify it, and some techniques that are used to characterise it.

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:

AQF Level of Program						
	5	**6**	**7**	**8**	**9**	**10**
Level						
Introductory						
Intermediate						
Advanced			✔			

Learning Outcomes:

Students completing this course should be able to:

Knowledge:

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K1. Explain the terminology, concepts and principles of the regolith, the blanket of soil and weathered and transported material that overlies fresh rock.

K2. Appraise the main elements of the relationship between the regolith and its parent rock.

K3. Evaluate the aspects of regolith geology and soil science that have significance for the interpretation of geological history, for mineral exploration and for environmental investigations.

Skills:

S1. Identify the major types of regolith, including soil.

S2. Document and interpret the characteristics of regolith, including soil.

S3. Conduct regolith mapping in the field.

Application of knowledge and skills:

A1. Employ understanding of regolith processes in mineral exploration and environmental management.

A2. Apply knowledge of regolith processes to relevant research projects.

Course Content:

Topics may include:

- Understanding the regolith, including soils;
- Terminology of soils and regolith;
- Regolith materials and their genesis;
- Development of weathering profiles;
- Soil biology;
- Regolith, soils and hydrology;
- Regolith and its relationship to salinity;
- Application of regolith to environmental issues;
- Regolith-landform evolution;
- Regolith mapping;
- Mineral exploration in the regolith;
- Principles of geochemical exploration;
- Element dispersion during weathering;
- Regolith as sampling media (ferruginous materials, soils, calcrete etc);
- Regolith and climate change.

Values:

V1. Appreciate the discordance in rates of regolith processes and of human consumption of regolith resources.

Graduate Attributes:

FedUni graduate attributes statement. To have graduates with knowledge, skills and competence that enable them to stand out as critical, creative and enquiring learners who are capable, flexible and work ready, and responsible, ethical and engaged citizens.

Attribute	Brief Description	Focus
Knowledge, skills and competence	Grasp that every landform, every road cutting is a window on to the Earth`s regolith history.	High

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Attribute	Brief Description	Focus
Critical, creative and enquiring learners	Develop confidence in more or less remote areas by performing fieldwork Investigate aspects of regolith independently.	Medium
Capable, flexible and work ready	Appreciate the importance of soil and soil formation to modern society.	Medium
Responsible, ethical and engaged citizens	Adhere to expectations of facilitating organisations in the performance of fieldwork Appreciate the role of soils and the importance of their preservation for society.	Medium

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, S1, S2, A2	Laboratory/field practicals.	Report	30-50%
K2, S1, S2, S3, A2	Regolith-landform mapping.	Map & Report	20-40%
K1, K2, K3, S1, S2, S3, A1	Comprehension and synthesis of course content.	Final examination	20-40%

Adopted Reference Style:

Other (Australian Journal of Earth Sciences)