Faculty of Engineering

School of Minerals and Energy Resources Engineering

Course Outline

MINE 5010

Fundamentals of Rock Behaviour

Ismet Canbulat

CONTENTS

1 INFORMATION ABOUT THE COURSE

Course Code:	MINE5010	Semester:	S1, 2020	Level:	PG	Units/Credits	6 UOC
Course Name:	**Fundamentals of Rock Behaviour**						

Course Convenor:	***Ismet Canbulat***		
Contact Details	School of Minerals and Energy Resources Engineering	EMAIL:	i.canbulat@unsw.edu.au
		Phone:	+61 2 9385 0721
Contact times	By appointment or emails		

1.1 Course Description

Welcome to MINE5010 Fundamentals of Rock Behaviour. This course is designed to introduce engineers and geologists to the major geomechanics components associated with coal mining operations, from resource evaluation and mine design to daily operations. It is, therefore, ideally suited to open cut and underground coal engineers or geologists who have an understanding and experience in the coal mining industry but are seeking to develop more specialist skills in the geomechanics field.

The course content will include the following components:

- Fundamental of rock mechanics
- Intact rock characterisation
- Discontinuities characterisation and modelling
- Rock mass classification
- Fundamental of coal geology
- Mine Design issues
- Ground control management and environmental geomechanics.

The course is structured to provide an initial overview of basic principles and terminology plus the major geomechanical properties and behavioural characteristics of rock material.

An important component will be an emphasis on the interdependencies between geotechnical parameters and coal mine design/operational decisions and requirements. The link between geological and engineering disciplines is an important component in successfully managing these dependencies.

This course is an Intensive, four-day workshop program conducted at UNSW from 16 to 20 March 2020.

How much time is required?

This course is worth 6 UOC. It will be presented in a block mode. It is recommended that approximately 150 hours is required for this course, for satisfactory performance in this program, depending on background and experience. It is the students' responsibility to manage and plan workloads as much as possible to enable a minimum of 8 hours per week.

1.2 Course Completion

Course completion requires:

- submission of **all assessment items**; failure to submit all assessment items will result in the award of an Unsatisfactory Failure (UF) grade for the Course.

1.3 Assumed Knowledge

This course assumes a student has knowledge of

- as this is a technical course in a postgraduate program, a fundamental understanding of both Mathematics and Physics to a standard at least equivalent to a first year course in a university engineering program
- basic mining and geological terms and descriptions
- mining systems.

2 AIMS, LEARNING OUTCOMES AND GRADUATE ATTRIBUTES

2.1 Course Aims

This course aims to equip the student with knowledge and skills to design and select appropriate Geomechanics techniques for different mining applications.

2.2 Learning Outcomes

It is intended that students will be able to:

1. Understand the basic mechanical properties of rock and how these are applied to analyse problems in coal mining geomechanics.
2. Have a sound working knowledge of fundamental mechanisms and geotechnical principles within the context of practical coal mining applications;
3. Recognise the role and importance of these principles in a comprehensive range of coal mining applications, both from a technical perspective, and from the risk and operational management perspective.
4. Have a broad knowledge of key numerical methods used in mining rock mechanics

2.3 Graduate Attributes

This course will contribute to the development of the following Graduate Attributes:

1. appropriate technical knowledge
2. having advanced problem solving, analysis and synthesis skills with the ability to tolerate ambiguity
3. ability for engineering design and creativity
4. awareness of opportunities to add value through engineering and the need for continuous improvement
5. being able to work and communicate effectively across discipline boundaries
6. having HSEC consciousness
7. being active life-long learners.

3 REFERENCE RESOURCES

3.1 Reference Materials

- MEA Report Writing Guide for Mining Engineers. P Hagan and P Mort (Mining Education Australia (MEA)). (Latest edition available for download from the School website or a hardcopy version is available from the UNSW Bookshop)
- Galvin, JM. (2016). Ground Engineering - Principles and Practices for Underground Coal Mining (Springer).
- Rock Mechanics for Underground Mining GHG Brady & ET Brown, 3rd edition, Kluwer Academic Press, 2004.
- Rock Mechanics and the Design of Structures in Rock. L Obert & WI Duvall, John Wiley & Sons (1967)
- Fundamentals of Rock Mechanics, JC Jaeger & NGW Cook, Chapman & Hall (1979).
- Rock Fracture Mechanics. BN Whittaker, RN Singh & G Sun, Elsevier (1992).
- Coal Mine Ground Control. SS Peng, John Wiley & Sons (1986).
- Geotechnical Instrumentation and Monitoring in Open Pit and Underground Mining. T Szwedzicki (ed.), AA Balkema (1993).
- Rock Support in Mining and Underground Construction. PK Kaiser & DR McCreath (eds.), AA Balkema (1992).
- Rock Slope Engineering. E Hoek & JW Bray, Inst. of Mining & Metallurgy, London (1994).
- Rockbursts in Coal Mines and their Prevention. G Brauner, AA Balkema (1994).
- Australian Coal Mining Practice – Monograph 12. AJ Hargraves, CH Martin (eds.), AusIMM (1975).
- Subsidence Engineers' Handbook. National Coal Board (1975).
- Rock Support and Reinforcement Practice in Mining. E Villaescusa, C Windsor & A Thompson (eds.), AA Balkema (1999).
- Cablebolting in Underground Mines. D Hutchinson & M Diederichs, BiTech Publishers (1996).
- Diederichs, M., Lato, M., Hammah, R., Quinn, P. 2007. Shear Strength Reduction (SSR) approach for slope stability analyses. Proceedings of the 1st Canada-US Rock Mechanics Symposium, Vancouver. pp. 319-327.
- Duncan, J., Wright, S. 2005. Soil Strength and Slope Stability, John Wiley & Sons Inc.
- Harrison, J., Hudson, J. 2000. Engineering Rock Mechanics: Illustrative Worked Examples. Elsevier Science, Oxford. 530 pp.
- Hatherly, P., Medhurst, T., MacGregor, S. 2008. Geophysical Strata Rating. ACARP project C15019. https://www.acarp.com.au/
- Hatherly, P., Medhurst, T., Zhou, B. 2013. Investigations for open pit geomechanics using geophysical logs, ACARP project C20025. https://www.acarp.com.au/
- Hoek, E. 2007. Practical Rock Engineering, Rocscience (online): https://www.rocscience.com/learning/hoek-s-corner.
- Hoek, E., Brown, E. 1980. Empirical strength criterion for rock masses. Journal of The Geotechnical Engineering Division. ASCE 106 (GT9), pp. 1013-1035.
- Hoek, E., Brown, E. 1988. The Hoek-Brown failure criterion – a 1988 update. Proceedings 15th Canadian Rock Mech. Symp. Toronto.
- Hoek, E., Marinos, P. 2007. A brief history of the development of the Hoek-Brown failure criterion. Soils and Rocks. No. 2.
- International Society for Rock Mechanics (ISRM) Commission on Standardization of Laboratory and Field Tests, 1978. Suggested methods for the quantitative description of discontinuities in rock masses. Int J Rock Mech Min Sci & Geomech Abstr. 15, pp. 319-368.
- Jaeger, J., Cook, N., Zimmerman, R. 2007. Fundamentals of Rock Mechanics (Fourth Edition). Blackwell Publishing, Oxford, UK.
- Mark, C., Molinda, G. 2005. The Coal Mine Roof Rating (CMRR) – A decade of experience. Intl J of Coal Geology. 64, pp. 85-103.

- Priest, S., Brown, E. 1983. Probabilistic stability analysis of variable rock slopes. Institution of Mining and Metallurgy Transactions. 92, pp. A1-A12.
- Sjoberg, J. 1999. Analysis of Large Scale Rock Slopes, Doctoral Thesis, Lulea University of Technology Department of Civil and Mining Engineering Division of Rock Mechanics, Sweden.
- Zhai, H., Canbulat, I., Hebblewhite, B., Zhang, C. 2017. Review of current empirical approaches for determination of the weak rock mass properties. Procedia Engineering. 191, pp. 908-917.

3.2 Other Resources

- *Guide to Authors,* 2008. (Australasian Institute of Mining and Metallurgy; Melbourne).

- *Style Manual for authors, editors and printers.* 6th edition, (John Wiley & Sons).

3.3 Online Resources

Selected readings as well as other supporting material (e.g. course outline and lecture notes will be made available on Moodle.

4 COURSE CONTENT AND LEARNING ACTIVITIES

4.1 Learning Activities Summary

Presentations and reading material are provided to provide students with technical information and examples of how geotechnical management processes are applied in the mining industry.

Discussions will be used to encourage students to articulate and defend positions, consider different points of view and evaluate evidence. Case studies will be used to provide practice in identifying potential problems and evaluating alternative course of actions.

UNSW Days	Day	Hrs.	Topic	Content/Activities	Presenter
1	16 Mar	8	Introduction to the Course and the Fundamentals of Rock Behaviour	Introduction to the program and the course	IC/CZ
				Minerals and Energy Resources Eng student OHS induction and assessment	
				Introduction to Moodle/Library Access	
				Fundamental of Geomechanics	
				Intact Rock, Discontinuity and Rock Mass	
2	17 Mar	8	Fundamentals of Rock Behaviour	Intact Rock, Discontinuity and Rock Mass (Cont'd)	CZ
				Rock mechanics lab inspection/induction	
				Assignments discussion	
3	18 Mar	8	Geology and Geophysics	Fundamentals of geology	HR/SC
				Fundamentals of geophysics	
4	19 Mar	8	Mine Geology Investigations	Impact of geology on mining – case studies	IC
				Closing remarks and discussion	

Total student effort hours: Approx. 150

(Note: The above indication of "student effort hours" is indicative only – It reflects the anticipated level of total student involvement with the course – either through accessing or participating in online materials and activities; private research; preparation of assignments. Individual students may find their level of involvement differs from this schedule.

5 COURSE ASSESSMENT

5.1 Assessment Summary

The range of assessment tasks have been designed to ensure a student can demonstrate they have satisfactorily attained the minimum requirements of the course as defined in the *Learning Outcomes* of the course and *Graduate Attributes* of the program. The student is also advised to review the relevant *Assessment Criteria* before completing each of the assessment items.

Item No.	*Assessment*	*Due Date*	*Weighting*	*Learning outcomes*
A01	**Individual report** – Lab Assignment	13 Apr 11:59pm	35%	1,2,3,4
A02	**Individual report** - Geology & Geophysics Assignments 1. 15% Team-based activities 2. 15% Individual quizzes 3. 35% Individual geology assignment	20 Apr 11:59pm	65%	1,2,3,4

5.2 Assessment Requirements

- All the course materials and assignments will be available online through Moodle. Access to the Moodle site is via the Moodle icon on the MyUNSW homepage, or at https://moodle.telt.unsw.edu.au

When

- As indicated above.
- Early submission is required in cases where the student will otherwise be absent on the due date of submission.
- Prior to submission, students should read the School Policy on *Assignment Submissions* which can be viewed at: www.engineering.unsw.edu.au/mining-engineering/what-we-do/about-the-school/school-general-guidelines
- In particular, the student should make sure they have read and understood the:
  - Declaration of Academic Integrity;
  - Assignment Submission requirements detailed in the *University Policies* section of the Course Outline; and
  - School Policy on *Assignment Submission* available on the School's website (the web address is given in the Course Outline). In particular note the requirement that only PDF documents should be uploaded and the required file naming convention.

Where

- *Submissions must be made electronically* through Turnitin in Moodle unless otherwise stated. Turnitin is a plagiarism checking service that will retain a copy of the assessment item on its database for the purpose of future plagiarism checking.

What

- Submission requirements for all assignments are listed in Section 5.
- The submission must be:
  - a single document in PDF format; and

- prepared in the form of a formal report that includes a list of reference sources cited in the report, prepared in accordance with the report writing standards of the School as contained in the ***MEA Report Writing Guide for Mining Engineers***. A copy can be obtained from the UNSW Bookshop or downloaded from the School webpage.

How

- The submitted document must be consistent with the following file naming convention: < **FamilyNameInitials_CourseCode_AssignmentNumber.pd**f >.
- A typical complaint filename would take the following form < *SmithPD_MINE5010_A01.pdf* > which elements correspond to:
  - Family name of student: Smith
  - Initial(s) of student: PD
  - Course Code: MINE5010
  - Assignment number: A01...as defined in the Course Outline for the assessment task
  - File format: PDF document

5.3 Penalties for Non-Compliant Submission

A submission that is non-compliant with the School Policy on *Assignment Submission* and/or requirements as contained in this Course Outline may not be marked and/or penalty marks subtracted from the assignment mark for non-compliance.

Some examples of a non-compliant assignment include that the assignment submission:

- is not a single PDF document. *Penalty for non-compliance:* assignment not marked.
- is not fully consistent with the designated file naming convention as listed above and defined as Item #6 in the School Policy on electronic submission. For example, a file name such as < *RAScope.pdf* > is NOT compliant.
- does not have appended at the end of the assignment a completed self-assessment by the student of the assignment using the official *Assessment Criteria* template.

6 ASSESSMENT CRITERIA

The following assessment criteria provide a framework for students when preparing assignments in the course as well as a guideline for assessors when marking an assignment. The student is advised to review the relevant framework before undertaking their assignment.

The criteria listed for each item of assessment and the descriptions contained therein are not intended to be prescriptive nor is it an exhaustive list. Rather it should be viewed as a framework to guide the student as to the type of information and depth of coverage that is expected to be evident in a submission for assessment; the framework illustrates for example what would distinguish an excellent achievement from a poor achievement.

The student should be cognisant that a range of factors is often being assessed in any one assignment; not just whether the final results are numerically correct. Consideration is given to other relevant elements that contribute to the *Learning Outcomes* of the course as well as the *Graduate Attributes* of the overall degree program.

The student is cautioned against merely using the assessment criteria as a checklist. When assessing an assignment, elements in the framework will be examined in terms of quality and creativity. Hence ensuring all the listed elements are merely covered in an assignment is often not sufficient in itself and will not automatically lead to full marks being awarded. Other factors such as how the student went about presenting information, how an argument was structured and/or the elements supporting a particular recommendation or outcome are also important.

Finally the framework can also be used to provide feedback to a student on their performance in an assignment.

6.1 Assignment Reports

The assessment criteria that will be used in assessing the assignment reports is summarised in the following table.

Criteria	Excellent		Good		Satisfactory		Unsatisfactory		Poor		-
Executive Summary	The executive summary has clearly defined objectives and methodology of the project and includes a comprehensive summary of the findings and outcomes of the project.		The executive summary has defined objectives and methodology of the project and includes some summary of the findings and outcomes of the project.		The executive summary has defined objectives and methodology of the project with minor errors in summary of the findings and outcomes of the project.		The executive summary has some defined objectives and methodology of the project with errors in summary of the findings and outcomes of the project.		The executive summary has poorly defined objectives and methodology of the project with major errors in summary of the findings and outcomes of the project.		Provided no executive summary.
	5		4		3		2		1		0
Assumptions	Provided a comprehensive list of all the assumptions (e.g. geological model, geotechnical considerations, etc.) for the project with sound justification for the selection.		Provided a list of some of the assumptions (e.g. geological model, geotechnical considerations, etc.) for the project with sound justification for the selection.		Provided an incomplete list of assumptions (e.g. geological model, geotechnical considerations, etc.) for the project with some justification for the selection.		Provided an incomplete list of assumptions (e.g. geological model, geotechnical considerations, etc.) for the project with little justification for the selection.		Provided a limited list of assumptions (e.g. geological model, geotechnical considerations, etc.) for the project with little justification for the selection.		Provided no assumptions (e.g. geological model, geotechnical considerations, etc.) for the project.
	5		4		3		2		1		0
Design/testing/ modelling	Provided a comprehensive technical justification for the topic and provided a justification for assumptions made, taking into account all relevant factors.		Provided a comprehensive technical justification for the topic and provided justification for assumptions made, taking into account some factors.		Provided some technical justification for topic and provided assumptions, taking into account some relevant factors.		Provided some technical justification for the topic and provided assumptions, taking into account limited amount of factors.		Provided limited technical justification for the topic and fundamentally flawed assumptions, taking into account amount of factors.		Provided no technical justification for the topic and fundamentally flawed assumptions, taking into account no factors.
	35	33	32	22	21	13	12	5	4	1	0
Safety/technical benefits	Provided comprehensive technical and safety improvement model		Provided comprehensive technical and safety improvement model with minor errors.		Provided sound technical and/or safety improvement model with minor errors with minor errors.		Provided some technical and/or safety improvement model with minor errors with minor errors.		Provided poor technical and/or safety improvement model with minor errors with minor errors.		Provided no technical and/or safety improvement model.
	35	33	32	22	21	13	12	5	4	1	0
Layout and standard of Report	Excellent logical structure, physical layout and attention to detail. No or few spelling mistakes or grammatical errors.		Good logical structure and physical layout. No or few spelling mistakes or grammatical errors.		Acceptable structure and physical layout. Some spelling mistakes or grammatical errors. Some errors in referencing.		Unacceptable structure and physical layout. Numerous spelling mistakes or grammatical errors. Errors in referencing.		Very little structure and physical layout. Numerous spelling mistakes or grammatical errors. Errors in referencing.		Report has no layout and structure.
	10	9	8	7	6	5	4	3	2	1	0
Conclusions and recommendations	The analysis of the work conducted highlights your comprehension and shows insight into the significance of the results. The report concludes with a clear concise summary of the outcomes and includes qualification.		The analysis of the work conducted demonstrates some comprehension. The report concludes with a summary of outcomes.		The analysis of the work conducted demonstrates limited comprehension. The report concludes with some summary of outcomes.		The analysis of the work conducted demonstrates limited or no comprehension. The report concludes with a poor summary of outcomes.		The analysis of the work conducted demonstrates lack of comprehension. The report concludes with a poor summary of outcomes.		No conclusions drawn from the analysis.
	10	9	8	7	6	5	4	3	2	1	0

7 STUDYING A PG COURSE IN MINING ENGINEERING AT UNSW

7.1 How We Contact You

At times, the School or your lecturers may need to contact you about your course or your enrolment. Your lecturers will use the email function within Moodle or we will contact you on your @student.unsw.edu.au email address.

We understand that you may have an existing email account and would prefer for your UNSW emails to be redirected to your preferred account. Please see these instructions on how to redirect your UNSW emails: https://www.it.unsw.edu.au/students/email/index.html

7.2 How You Can Contact Us

We are always ready to assist you with your inquiries. To ensure your question is directed to the correct person, please use the email address below for:

Enrolment or other admin questions regarding your program: postgrad.mining@unsw.edu.au

Course inquiries: these should be directed to the Course Convenor.

7.3 Computing Resources and Internet Access Requirements

UNSW Mining Engineering provides blended learning using the on-line Moodle LMS (Learning Management System).

It is essential that you have access to a PC or notebook computer. Mobile devices such as smart phones and tablets may compliment learning, but access to a PC or notebook computer is also required. Note that some specialist engineering software is not available for Mac computers.

You can access the School's computer laboratory in-line with the School laboratory access guidelines and Class bookings.

It is recommended that you have regular internet access to run Moodle most effectively.

More information about system requirements is available at www.student.unsw.edu.au/moodle-system-requirements

7.4 Accessing Course Materials Through Moodle

Course outlines, support materials are uploaded to Moodle. In addition, on-line assignment submissions are made using the assignment dropbox facility provided in Moodle. All enrolled students are automatically included in Moodle for each course. To access these documents and other course resources, please visit: www.moodle.telt.unsw.edu.au

7.5 Assignment Submissions

The School has developed a guideline to help you when submitting a course assignment. Please take a closer look at all these details on our website: www.engineering.unsw.edu.au/mining-engineering/assignment-submission-policy

We encourage you to retain a copy of every assignment submitted for assessment for your own record either in hardcopy or electronic form. On a rare occasion, assignments may be mislaid and we may contact you to re-submit your assignment.

7.6 Late Submission of an Assignment

Full marks for an assignment are only possible when an assignment is received by the due date. In fairness to those students who do meet the assignment due date and time, deductions will apply to submissions made after this time. Details on deductions that are automatically applied to late submissions are available on our webpage: www.engineering.unsw.edu.au/mining-engineering/late-submissions

We understand that at times you may not be able to submit an assignment on time, and the School will accommodate any fair and reasonable extension. We would recommend you review the UNSW Special Consideration guidelines – see following section.

In the case of the assignment reports, penalty marks will be applied at the following rate if submitted after the due date: five (2) percentile points of the maximum possible mark for each day or part thereof that the assessment is overdue.

7.7 Special Consideration

You can apply for special consideration through UNSW Student Central when illness or other circumstances interfere with your assessment performance. Sickness, misadventure or other circumstances beyond your control may:

- Prevent you from completing a course requirement,
- Keep you from attending an assessable activity,
- Stop you submitting assessable work for a course,
- Significantly affect your performance in assessable work, be it a formal end-of-semester examination, a class test, a laboratory test, a seminar presentation or any other form of assessment.

We ask that you please contact the Course Convenor immediately once you have completed the special consideration application, no later than one week from submission.

More details on special consideration can be found at: www.student.unsw.edu.au/special-consideration

7.8 Course Results

For details on UNSW assessment policy, please visit: www.student.unsw.edu.au/assessment

In some instances your final course result may be withheld and not released on the UNSW planned date. This is indicated by a course grade result of either:

- WD – which usually indicates you have not completed one or more items of assessment or there is an issue with one or more assignment; or
- WC – which indicates you have applied for Special Consideration due to illness or misadventure and the course results have not been finalised.

In either event it would be your responsibility to contact the Course Convener as soon as practicable but no later than five (5) days after release of the course result. If you don't contact the convener on time, you may be required to re-submit an assignment and may result in you failing the course. You would also have a NC (course not completed) mark on your transcript and would need to re-enroll in the course.

7.9 Students Needing Additional Support

The Student Equity and Disabilities Unit (SEADU) aims to provide all students with support and professional advice when circumstances may prevent students from achieving a successful university education. Take a look at their webpage: www.studentequity.unsw.edu.au/

7.10 Academic Honesty and Plagiarism

Your lecturer and the University will expect your submitted assignments are truly your own work. UNSW has very clear guidelines on what plagiarism is and how to avoid it. Plagiarism is using the words or ideas of others and presenting them as your own. Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. The University has adopted an educative approach to plagiarism and has developed a range of resources to support students. All the details on plagiarism, including some useful resources, can be found at www.student.unsw.edu.au/plagiarism.

All Mining Engineering students are required to complete a student declaration for academic integrity which is outlined in the assignment cover sheets. By signing this declaration, you agree that your work is your own original work.

If you need some additional support with your writing skills, please contact the Learning Centre or view some of the resources on their website: www.lc.unsw.edu.au/. The Learning Centre is designed to help you improve your academic writing and communication skills. Some students use the Centre services because they are finding their assignments a challenge, others because they want to improve an already successful academic performance.

7.11 Report Writing Guide for Mining Engineers

The School has a report writing guide (RWG) available for all mining engineering students.
View this website to download a copy of this guide: https://www.engineering.unsw.edu.au/mining-engineering/sites/mine/files/publications/MEA_ReportWritingGuide_eBook_2018ed.pdf

7.12 Continual Course Improvement

At the end of each course, all students will have the opportunity to complete a course evaluation form. These anonymous surveys help us understand your views of the course, your lecturers and the course materials. We are continuously improving our courses based on student feedback, and your perspective is valuable.

We also encourage all students to share any feedback they have any time during the course – if you have a concern, please contact us immediately.

8 SCHOOL ASSESSMENT COVER SHEET

School of Minerals and Energy Resources Engineering

Assessment Cover Sheet

Course Convenor: _____

Course Code: _____ Course Title: _____

Assignment: _____

Due Date: _____

Student Name: _____ Student ID: _____

ACADEMIC REQUIREMENTS

Before submitting this assignment, the student is advised to review:

- the assessment requirements contained in the briefing document for the assignment;
- the various matters related to assessment in the relevant Course Outline; and
- the *Plagiarism and Academic Integrity* website at < http:/www.lc.unsw.edu.au/plagiarism/pintro.html > to ensure they are familiar with the requirements to provide appropriate acknowledgement of source materials.

If after reviewing this material there is any doubt about assessment requirements, then in the first instance the student should consult with the Course Convenor and then if necessary with the Director – Undergraduate Studies.

While students are generally encouraged to work with other students to enhance learning, all assignments submitted for assessment must be their entire own work and duly acknowledge the use of other person's work or material. The student may be required to explain any or all parts of the assignment to the Course Convenor or other authorised persons. *Plagiarism* is using the work of others in whole or part without appropriate acknowledgement within the assignment in the required form. *Collusion* is where another person(s) assists in the preparation of a student's assignment without the consent or knowledge of the Course Convenor.

Plagiarism and *Collusion* are considered as Academic Misconduct and will be dealt with according to University Policy.

STUDENT DECLARATION OF ACADEMIC INTEGRITY

I declare that:

- This assessment item is entirely my own original work, except where I have acknowledged use of source material [such as books, journal articles, other published material, the Internet, and the work of other student/s or any other person/s].
- This assessment item has not been submitted for assessment for academic credit in this, or any other course, at UNSW or elsewhere.

I understand that:

- The assessor of this assessment item may, for the purpose of assessing this item, reproduce this assessment item and provide a copy to another member of the University.
- The assessor may communicate a copy of this assessment item to a plagiarism checking service (which may then retain a copy of the assessment item on its database for the purpose of future plagiarism checking).

Student Signature: Date:

Students are advised to retain a copy of this assessment for their records and submission should be made in accordance to the assessment details available on the course Moodle site.