



FOSC201

Global Challenges and STEM

S1 Day 2019

Science and Engineering Faculty level units

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	5
<u>Unit Schedule</u>	7
<u>Policies and Procedures</u>	9
<u>Graduate Capabilities</u>	10
<u>Changes from Previous Offering</u>	14

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General Information

Unit convenor and teaching staff Abidali Mohamedali abidali.mohamedali@mq.edu.au
Credit points 3
Prerequisites 9cp at 100 level
Corequisites 6cp at 200 level
Co-badged status
Unit description This is a core unit for the bachelor of Science- Global Challenges program and is a prerequisite for the FOSC303- Global Challenges Project. This unit is designed to introduce students to the causes and nature of global challenges and how Science can be used to solve them. The unit will develop critical skills in effective leadership, effective and persuasive communication, and teamwork. In addition, students will also learn to develop skills in reflection and entrepreneurial thought to develop resilience in the face of uncertainty. All this will be carried out with the backdrop of sustainability and ethical practice.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

- Identify and critically evaluate major global challenges using scientific evidence;
- Demonstrate teamwork capacity and knowledge of leadership
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Assessment Tasks

Name	Weighting	Hurdle	Due
Essay 1	15%	No	Week 3
Mid Semester Exam	20%	No	Week 7
Group Assignment	15%	No	Week 9
Weekly Reflection excersises	10%	No	Weekly
Elevator Pitch	10%	Yes	Week 12
Final Essay	30%	No	Week 12

Essay 1

Due: **Week 3**

Weighting: **15%**

A 1500 Word essay to critically evaluate the concept of global challenges and approaches to meeting them.

On successful completion you will be able to:

- Identify and critically evaluate major global challenges using scientific evidence;
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science

Mid Semester Exam

Due: **Week 7**

Weighting: **20%**

A 2 hour open book scenario based examination of practice of concepts of leadership and effective communication

On successful completion you will be able to:

- Demonstrate teamwork capacity and knowledge of leadership
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science

Group Assignment

Due: **Week 9**

Weighting: **15%**

Group assessment to communicate strategic visions and goals to solve global challenges.

On successful completion you will be able to:

- Demonstrate teamwork capacity and knowledge of leadership
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Weekly Reflection excersises

Due: **Weekly**

Weighting: **10%**

Reflection exercises that will tackle pertinent questions in leadership/ethics/global challenges

On successful completion you will be able to:

- Identify and critically evaluate major global challenges using scientific evidence;
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content

Elevator Pitch

Due: **Week 12**

Weighting: **10%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

This will be a 3 part pitch where students will have the opportunity to perfect their elevator pitch to describe who they are. This will be presented in oral and written form. The first pitch will not be assessed however feedback provided. The second pitch will be assessed for 3% of the final score and the last pitch for 7% of the final score.

On successful completion you will be able to:

- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Final Essay

Due: **Week 12**

Weighting: **30%**

Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science using case studies. This essay will comprise of 2 parts, a theoretical framework with case studies (1500 words), a strategy to achieve a named and identified goal for a specific global challenge with references to lessons learnt (1500 words). This will form the basis of the FOSC303 project the following year.

On successful completion you will be able to:

- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Delivery and Resources

Objective of the unit

This is a core unit for the bachelor of Science- Global Challenges program and is a prerequisite for the FOSC303- Global Challenges Project. This unit is designed to introduce students to the causes and nature of global challenges and how Science can be used to solve them. The unit will develop critical skills in effective leadership, effective and persuasive communication, and teamwork. In addition, students will also learn to develop skills in reflection and entrepreneurial thought to develop resilience in the face of uncertainty. All this will be carried out with the backdrop of sustainability and ethical practice.

This unit requires students to demonstrate a sophisticated understanding of how STEM can address the challenges facing the global community. They need to be able to analyse complex real-world problems and determine the best methods to use to solve them. This builds upon their foundational learning at the 100-level and contributes to the scaffolding required for their extensive 300-level project unit.

Textbook : Readings and reading materials to be provided on iLearn

4 Broad themes with a dedicated focus on STEM will be presented

1. Global challenges and STEM
2. Strategic thinking, leadership and project management
3. Ethics and ethical considerations in addressing global challenges

4. Strategic communication

Classes

Timetable: Lectures for this unit will be on at different times and locations as guest lecturers will be addressing the class. Announcements will be made on Ilearn and by eMail within the first week of semester. The first 4 lectures however will be in 4 Wallys Walk, Room 322 on Tuesdays 9-11am. Tutorials for this unit will be on Thursdays 9am-11am in 4 Wally's Walk Room 322.

Technology Used and Required

You are expected to access the unit iLearn web site on a frequent basis and to download all necessary PDF files. To access the unit web site, if you have off-campus Internet access, simply start your web browser and proceed as above for logging in. On-campus wireless access is also available. If you do not have your own computer you may wish to access the FOSC201 web resources on campus using the computers in the Library.

To view the lecture notes and other PDF files on the website, you will require Adobe Acrobat Reader Version 9 or later to be installed on your computer. Acrobat Reader can be downloaded from the Adobe website <http://get.adobe.com/uk/reader/>. If you are using the computers in the library, then Acrobat has already been installed.

We will also be using ECHO Interactive (from iLEARN) and therefore you will be **required** to bring your laptop, tablet, smartphone to the lectures.

Please note information may also be sent by email to your student email account so please look at your student email account on a frequent basis.

Unit Web Page

The web page for this unit is at Macquarie's new learning management system website: <http://ilearn.mq.edu.au>

Login and follow prompts to FOSC201.

You are expected to access the unit web site frequently (i.e., almost daily). This site contains important information including lecture notes (that you will be expected to access in class), mid-semester exams and/or assignment.

Logging In: Type in the URL <http://ilearn.mq.edu.au> and find **FOSC201**. Your username is your Macquarie Student ID Number (MQID), which is an 8 digit number found on your student card. The password is your myMQ Student Portal password. This will be the original MQID password (2 random characters followed by your date of birth in ddmmyy format) that was sent to you on enrolment, unless you have already changed your password in the myMQ Student Portal. If you experience difficulties in getting your reprint or your password, please contact the StudentIT Desk (ph: 9850 6500).

Teaching and Learning Strategy

FOSC201 is a 3-credit point half-year unit and will require an average of 9 hours of work per week (contact hours plus self-study time).

FOSC201 consists of:

- **1 hour of lectures** and
- **a 3 hour tutorial/workshop class** every week.

The lecture material and tutorial complement each other and have been developed to increase your understanding of the topics so you can achieve the learning outcomes.

The purpose of tutorials will be to develop higher level critical thinking skills.

The unit coordinator's expectation is that you will:

- Attend **all interactive** lectures. If you cannot attend a lecture, you are expected to listen to the iLecture as soon as possible after it is made available.
- Attend **all interactive tutorials** and demonstrate reasonable competence in all exercises and participate in each class/tutorial.
- Perform satisfactorily in all assessments.
- Spend an average of no less than 2 hours per week of private study in addition to direct contact.

If you prepare and attend all components of the unit and work consistently/continuously throughout the semester, you should be able to develop a strong understanding of global challenges to help you achieve greater goals post study including creating waves of positive impact.

You are expected to use the lecture materials in the lectures (or bring them) so you can spend most of the time listening rather than transcribing. The lectures are interactive and you will be expected to have input in polls and discussions. Do not assume notes or iLectures are in any way a suitable substitute for attending lectures – lecturers from all departments put an effort into making the lectures up to date and relevant.

Learning is an active process, and as such you must engage with the material. This means downloading and reading lecture notes and case studies completing reflection exercises and participating in poll questions online.

- The mid-semester exam will be run in a tutorial class.

Unit Schedule

Week	Lec	Topic	Tutorial topics (Thursdays - 9-11am)	Assignments due
1	1	Introduction to global challenges	Brainstorming techniques- Global challenges/ Elevator pitch Part 1	
	2	Global Challenges - A multifaceted perspective		
2	3	STEM and Global Challenges - 1	Research skills- Ethics/philosophy workshop	Week 1 Reflections

	4	Innovation, collaboration and leadership - Global Challenge perspective		
3	5	Essential Skills in STEM Leadership 1	Leadership workshop/presentations	ESSAY 1 DUE Week 2 Reflections
	6	Essential Skills in STEM Leadership 2		
4	7	Courageous Leadership	HBDI- Brain dominance tools Freshwater training room (3-6PM)	Week 3 Reflections
	8	Ethics and Ego in leadership		
5	9	Passion and Vision Maintenance/delivery	Strategic Thinking canvases	Week 4 Reflections
	10	Vision Creation –Seeds of Innovation		
6	11	Art of Negotiation 1	Communication and networking tutorial/ Elevator Pitch part 2	Week 5 Reflections
	12	Art of Negotiation 2		
7	13	Conflict Resolution 1	Mid Semester Examination	Week 6 Reflections
	14	Conflict Resolution 2		
MID SEMESTER BREAK				
8	15	Entrepreneurship in Science	Impact through entrepreneurship workshop- case studies and analysis.	Week 7 Reflections
	16	Solving global challenges through entrepreneurship		
9	17	Relationship building/ networking/collaboration	Business canvas	Week 8 Reflections
	18	Emotional intelligence		
10	19	Influencing Behavior in Science	Group assignment presentations REFLECTION Workshop	Week 9 Reflections
	20			
11	21	Impact in Science	Media training (social networking)	Week 10 Reflections
	22	Science communication and global challenges.		
12	23	Building a team	Tools and techniques workshop (leadership/ entrepreneurship/ management)	Week 11 Reflections
	24	Training/Coaching a team		

13	25	Time management/Work life balance	Project management workshop/ Elevator Pitch Part 3	Final Essay DUE
	26	Review and Revision	De brief	Week 12 Reflections

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Grade Appeal Policy](#)
- [Complaint Management Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#) (**Note:** *The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.*)

Undergraduate students seeking more policy resources can visit the [Student Policy Gateway \(https://students.mq.edu.au/support/study/student-policy-gateway\)](https://students.mq.edu.au/support/study/student-policy-gateway). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central \(https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central\)](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/study/getting-started/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Assessment tasks

- Mid Semester Exam
- Group Assignment

- Weekly Reflection excersises
- Final Essay

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcome

- Demonstrate teamwork capacity and knowledge of leadership

Assessment tasks

- Mid Semester Exam
- Weekly Reflection excersises
- Final Essay

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- Demonstrate teamwork capacity and knowledge of leadership
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content

Assessment tasks

- Weekly Reflection excersises
- Final Essay

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able

to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcome

- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Assessment tasks

- Group Assignment
- Final Essay

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Identify and critically evaluate major global challenges using scientific evidence;
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Assessment tasks

- Essay 1
- Mid Semester Exam
- Group Assignment
- Weekly Reflection excersises
- Final Essay

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative

in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcome

- Identify and critically evaluate major global challenges using scientific evidence;

Assessment tasks

- Essay 1
- Mid Semester Exam
- Weekly Reflection excersises
- Final Essay

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Demonstrate teamwork capacity and knowledge of leadership
- Effectively communicate strategic visions and goals to solve global challenges to a variety of audiences

Assessment tasks

- Essay 1
- Mid Semester Exam
- Group Assignment
- Elevator Pitch
- Final Essay

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Identify and critically evaluate major global challenges using scientific evidence;
- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science
- Demonstrate authenticity, personal values and ethical frameworks that have been identified through leadership development and reflection in form of digital content

Assessment tasks

- Essay 1
- Group Assignment
- Final Essay

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcome

- Articulate the importance of disruptive, innovative and entrepreneurial thinking to achieve impact through science

Assessment task

- Final Essay

Changes from Previous Offering

This is the first offering of this unit.