

<b>Academic Year</b>	AY2021/22	<b>Semester</b>	2
<b>Course Coordinator</b>	Professor Benjamin Horton		
<b>Course Code</b>	ES3103		
<b>Course Title</b>	Sea-level rise and coastal processes		
<b>Pre-requisites</b>	None		
<b>No of AUs</b>	2		
<b>Contact Hours</b>	Total hours – 26 (Lecture – 10; Tutorial – 13; Field – 3) Weeks 1-10: 1h lecture and 1h tutorial Week 11: 1h tutorial and 3h fieldtrip (not including travel) Week 12-13: 2x 1h tutorial		
<b>Proposal Date</b>	15 June 2021		

### Course Aims

This course aims to provide you with the understanding of the processes that control variations in sea level. You will learn about how sea level changes through time and space, and how understanding the past and the present is key to predicting the future. You will undertake a field trip, to better gain experience in how sediments archive records of the past. You will also carry out a group project on the relationship between global, regional and local sea-level change.

### Intended Learning Outcomes (ILO)

By the end of this course, you (as a student) would be able to:

1. Define the different mechanisms underpinning variations in sea-level change across spatial and temporal scales.
2. Compare coastal systems and their response to sea-level change.
3. Apply relevant procedures to reconstruct sea-level from the geological record.
4. Illustrate how future projections are made and their limitations.
5. Evaluate the possible impacts of extreme sea-level events around Southeast Asia.
6. Evaluate risk posed to coastal communities as a result of sea-level rise.
7. Accurately communicate relevant scientific knowledge.

### Course Content

The course will introduce you to the key concepts that underpin sea-level science. You will explore how sea level has changed through time and the processes that drive spatial variations. We will look at how coastal systems evolve as sea-level changes, and the implications of such evolutions. The class will look at how changes in the solid earth can influence sea level and how changes in sea level are recorded in geological records. Finally, we will look at extremes in sea level and the hazards and risks posed to society. Each topic will be comprised of a single lecture, followed by a tutorial to further explore the concepts. Finally, you will take part in a field trip, to recover geological records of sea level.

**Assessment (includes both continuous and summative assessment)**

Component	Course LO Tested	Related Programme LO or Graduate Attributes (See App 1)	Weighting	Team/Individual	Assessment Rubrics
1. Continuous Assessment	1-6	1	30%	Individual weekly MCQ quiz to test understanding.	
2. Tutorial Participation	1-7	1, 2, 4	10%	Individual	Appendix 2
3. Poster Production	7	2, 3, 4, 5, 6	30%	Team	Appendix 3
4. Poster Presentation	7	1, 2, 4	30%	Individual	Appendix 4
Total			100%		

**Formative feedback**

Students will receive scores and work through of correct answers for component 1, direct oral feedback for component 2, both written and oral feedback for components 3 and 4. There will also be peer evaluation to evaluate individual contribution to the team assessment.

**Learning and Teaching approach**

Approach	How does this approach support students in achieving the learning outcomes?
Lecture	Lectures will pass on the theoretical knowledge required to understand the different components of sea-level change and coastal processes.
Weekly tutorial	Students will be expected to discuss assigned reading material relevant to the weekly lecture topic. They will receive feedback and improve communication skills, critical readings skills and confidence.
Field excursion	Pulau Ubin offers the opportunity to witness how sediments archive past histories of sea-level change. It also offers the opportunity to develop the skills required to collect geological data and to better understand coastal processes.

**Reading and References**

This course will be based on original research and review articles, mixing classical papers with the latest research and newly emerging topics. Papers will vary from year to year as new research is published.

The core book for the course is: Dawson, Alastair. (2019). Introducing Sea Level Change. Dunedin Academic Press, First Edition, ISBN-13 : 978-1780460871

## **Course Policies and Student Responsibilities**

### **(1) General**

*Students are expected to complete all assigned pre-class readings and activities, attend all seminar classes punctually and take all scheduled assignments and tests by due dates. Students are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions they have missed. Students are expected to participate in all seminar discussions and activities.*

### **(2) Absenteeism**

*TBL requires you to be in class to contribute to team work. In-class activities make up a significant portion of your course grade. Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for in-class activities.*

*If you miss a seminar session, you must inform your team members and me via email (include email address) prior to the start of the class. Students who miss T-RATs and team in-class activity with valid reasons will earn the team score. Students who miss I-RAT or T-RAT without a valid reason will earn nothing for that session of absence.*

*For I-RAT scores, we will consider the best of ten I-RATs out of twelve I-RATs. This method will take care of students who miss classes with valid reasons. Students, who miss I-RATs more than twice with valid reasons, may be asked to take a separate test.*

### **(3) Online Compulsory Assignments**

*You are required to submit online compulsory assignments on due dates. You have three attempts. The latest score will be considered in the course assessment.*

*For another example, please refer to <http://www.ntu.edu.sg/tlpd/ta/Pages/Policy.aspx>*

## **Academic Integrity**

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic](#)

[integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

### Diversity and inclusion policy

Integrating a diverse set of experiences is important for a more comprehensive understanding of science.

It is our goal to create an inclusive and collaborative learning environment that supports a diversity of thoughts, perspectives and experiences, and that honours your identities; including ethnicity, gender, socioeconomic status, sexual orientation, religion or ability.

To help accomplish this:

- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with one of the instructors or an ASE faculty member. We want to be a resource for you.
- Your classmates and instructors (like many people) are still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to the instructors or an ASE faculty member about it.
- As a participant in course discussions, you should also strive to honour the diversity of your classmates. You can do this by: using preferred pronouns and names; being respectful of others opinions and actively making sure all voices are being heard; and refraining from the use of derogatory or demeaning speech or actions.

All members of the class are expected to adhere to the [NTU anti-harassment policy](#). if you witness something that goes against this or have any other concerns, please speak to your instructors or an ASE faculty member.

### Course Instructors

Instructor	Office Location	Phone	Email
Ben Horton	N2-01c-41	6592 3255	bphorton@ntu.edu.sg
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David Lallemand	N2-01c-45	6592 3199	dlallemand@ntu.edu.sg
Geoff Richards	N2-01a-14		geoff.richards@ntu.edu.sg

### Planned Weekly Schedule

Week	Topic	Course LO	Readings/ Activities
1	Introduction	1	See Note
2	Glaciations	1	See Note
3	Waves and Tides	1, 2	See Note
4	Coastal Systems	1, 2	See Note
5	Solid Earth	1, 2	See Note
6	Geological Sea Level	1, 2, 3	See Note
7	Extreme Sea Level	1,2, 5	See Note
8	Projections	1,2, 4	See Note
9	Risk	1,2, 5, 6	See Note

10	Project	1,2,3,4,5,6,7	See Note
11	Project	1,2,3,4,5,6,7	See Note
12	Project	1,2,3,4,5,6,7	See Note
13	Project	1,2,3,4,5,6,7	See Note

Note: This is an advanced course, and a key learning objective is to use scientific literature. Hence, the course literature will consist of original research and review papers that will be provided in advance of tutorials. Papers will vary from year to year as new research is published.

### Appendix 1: ASE learning outcomes

At the completion of your course of study in ASE, you will be able to:

- 1) Demonstrate intellectual flexibility and critical thinking in order to apply environmental knowledge in the real world
- 2) Communicate environmental concepts with enthusiasm to varied audiences both orally and in writing
- 3) Formulate scientific questions, and be able to access and analyse quantitative and qualitative information to address them
- 4) Exhibit the motivation, curiosity and skills for lifelong learning
- 5) Demonstrate ethical values and responsibility
- 6) Collaborate and lead by influence

### Appendix 2: Assessment Criteria for participation in discussion tutorials

Criteria	Standard				
	A+ (Exceptional) A (Excellent)	A- (Very good) B+ (Good)	B (Average) B- (Satisfactory) C+ (Marginally satisfactory)	C (Bordering unsatisfactory) C- (Unsatisfactory)	D, F* (Deeply unsatisfactory)
Contribution to class discussion	Important; Meaningful	Meaningful	Some	Minimal	Very minimal to none
Capacity to articulate and present points of view	Very clear	Clear	Some	Limited	None
Respectful discussion where all students contribute and no-one dominates the conversation	Achieved	Achieved	Not consistently	Limited	No
Evidence of having read and assimilated the assigned reading	Yes	Yes	Some familiarity with the assigned reading	Little familiarity with the assigned reading	None
Arguments and debates about the topic, based on the	Well-reasoned	Some evidence	Some evidence of having	Little serious thought about	Unexplained or unjustified

literature and student's own insights and knowledge		of reasoning	considered the discussion topic	the discussion topic	absences from discussions
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### Appendix 3: Assessment Criteria for group poster production

Note: There will be peer evaluation to evaluate individual contribution to the team

Standards	Criteria
A+ to A-	Demonstrate complete understanding of their project. Connect to the topics covered to solve the problems at hand. Independently propose possibility of applying other modalities by assessing their merits and demerits. Convey the problematics and outcomes of their project with clarity and fluency.
B+ to B-	Demonstrate good understanding of their project. Connect to the topics covered and solve most problems. Can convey the problematics and outcomes of their project.
C+ to C	Demonstrate incomplete understanding of their project. Partly connect to the topics covered and solve only few problems. Incompletely convey the problematics and outcomes of their project.
D+ to D	Demonstrate only basic understanding of their project and lack solution for it. Confuse in conveying the problematics of their project.
F	Lack understanding of their project. Cannot convey the problematics.

### Appendix 4: Assessment Criteria for individual poster presentation

Standards	Criteria
A+ (Exceptional) A (Excellent)	<ul style="list-style-type: none"> <li>- Exceptionally well prepared presentation, well timed and rehearsed.</li> <li>- Content is exceptionally well structured and presented in a clear and engaging way.</li> <li>- Content reflects the important aspects of the reading, highlighting key points and issues exceptionally well.</li> <li>-Introduces additional knowledge through secondary readings at appropriate times.</li> <li>- Any questions are answered knowledgably.</li> <li>- The student shows engagement and understanding by asking thoughtful questions to the other presenters.</li> </ul>
A- (Very good) B+ (Good)	<ul style="list-style-type: none"> <li>- Well prepared presentation, well timed and rehearsed.</li> <li>- Content is well structured and presented in a clear and engaging way.</li> <li>- Content reflects the important aspects of the reading, highlighting key points and issues well.</li> <li>-Introduces some additional knowledge through secondary readings at appropriate times.</li> <li>- Any questions are answered correctly.</li> </ul>

	<ul style="list-style-type: none"> <li>- The student shows engagement and understanding by asking questions to the other presenters.</li> </ul>
<p>B (Average)  B- (Satisfactory)  C+ (Marginally satisfactory)</p>	<ul style="list-style-type: none"> <li>- Shows some preparation for presentation, reasonable timing and no reading from notes.</li> <li>- Content is adequately structured and presented.</li> <li>- Content reflects some important aspects of the reading, highlighting some key points and issues.</li> <li>- Any questions are answered correctly.</li> <li>- The student shows some engagement and understanding by sometimes asking questions to the other presenters.</li> </ul>
<p>C (Bordering unsatisfactory)  C- (Unsatisfactory)</p>	<ul style="list-style-type: none"> <li>- Presentation preparation limited, timing not consistent with instructions.</li> <li>- Content has little structure and the presentation is difficult to follow.</li> <li>- Content reflects some aspects of the reading, failing to highlight one or two key points and issues.</li> <li>- Any questions are answered mostly correctly.</li> <li>-</li> </ul>
<p>D, F (Deeply unsatisfactory)</p>	<ul style="list-style-type: none"> <li>- Presentation poorly prepared and carried out.</li> <li>- Content poorly structured and difficult to follow.</li> <li>- Content fails to reflect key aspects of assigned reading.</li> <li>- Cannot answer relevant questions.</li> <li>- The student does engage or ask questions during other students' presentations.  OR failure to deliver presentation.</li> </ul>