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**Communication  
Intensive Courses**

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Earth and Planetary Sciences  
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every challenge is an opportunity



***ONLINE PEDAGOGY***



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WIKIPEDIA**



## My Himalaya Term Paper

By Mr. Did-it For-the-Grade.

Such-and-such a date.

### The Himalaya.

The Himalaya is a geological region. It's probably really interesting but I wrote this paper in a rush last night so please don't mind my misspellings and somehow find this blather interesting or just get bored and stop reading it and give me a decent grade because faults and folds. Actually come to think of it the Himalaya has faults and folds, because it's a contractional mountain belt. And already this is better than a lot of term papers! Still, no references so far ;) ... let's keep it that way! Ultimately this term paper, like most others, is a tale told by an idiot, full of sound and fury and flowery stuff meant to seem super smart and fill space, signifying nothing.

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EASC4407  
Regional Geology

## Lesser Himalayan Strata

One of the major depositional strata in the Himalaya is the **Lesser Himalayan Strata** from the Paleozoic to Mesozoic eras. It had a quite different marine succession during the Paleozoic, as most parts of it are sparsely fossiliferous or even devoid of any well-defined fossils. Moreover, it consists of many varied lithofacies, making correlation work more difficult. This article describes the major formations of the *Paleozoic – Mesozoic Lesser Himalayan Strata*, including the *Tal Formation*, *Gondwana Strata*, *Singtali Formation* and *Subathu Formation*.

### Contents

#### Geological background

##### Tal Formation

##### Gondwana strata

- Central Himalaya – Central and Western Nepal
- Eastern Himalaya – Bhutan

##### Singtali and Subathu formations

- Singtali Formation
- Subathu Formation
- Distinctions between the Singtali and Subathu Formations

##### Geological significance during Paleozoic to Mesozoic times

- Gondwana strata
- Tectonic events related to Singtali Formation
- Tectonic events related to Subathu Formation

##### See also

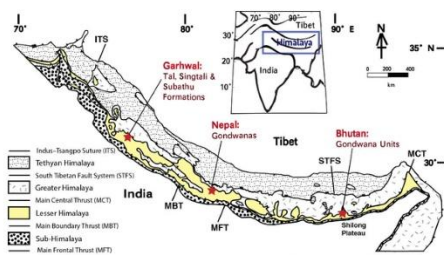
##### References

### Geological background

The Himalayan mountain chain is a fold and thrust belt that can be divided into four units bounded by thrusts from south to north: the Sub-Himalaya, Lesser Himalaya, Greater Himalaya and Tethyan Himalaya.<sup>[1]</sup> The Lesser Himalayan Zone has a lower relief and elevation of the mountains compared to Greater Himalaya. The Lesser Himalaya Sequence (LHS) is bounded by two main thrusts: the Main Central Thrust (MCT) in the north and the Main Boundary Thrust (MBT) in the south.<sup>[2]</sup>

The main layers of the LHS includes non-fossiliferous, low-grade, metasedimentary rocks, metavolcanic strata and augen gneiss. These have been dated as an age ranging from 1870 Ma to 520 Ma (i.e. Proterozoic to Cambrian).<sup>[3][4]</sup> Near the end of the Early Cambrian, there was a regional diastrophism (i.e. deformation of the Earth's crust) or crustal movement that heaved up the Indian subcontinent, interrupting the sedimentation in the Lesser Himalaya and causing a widespread unconformity in Nepal. This is known as the Great Lesser Himalayan Unconformity, which separates the older LHS from the overlying younger LHS that has an age of Permian to Middle Eocene.<sup>[2]</sup>

During the Paleozoic and Mesozoic, the LHS starts from the basal Tal Formation, which is part of the Outer Lesser Himalayan sequence in the Garhwal Himalaya. The Tal was deposited between the period of the Late Proterozoic to Palaeozoic Cambrian.<sup>[5]</sup> After that, there was a great hiatus between the Middle Proterozoic rocks and the overlying Palaeocene-Eocene strata.<sup>[6]</sup> This indicates that the LHS experienced a long period of denudation or



Geographic locations of major formations discussed. Modified from N.R. McKenzie et al. (2011).

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# EASC4407

# Regional Geology

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<b>WEEK 1</b> <i>Webb</i>	04-Sep-19	1-- Regional Geology: Topics, Solving Problem: 2-- <b>Introduction to Wikipedia Project</b>
	06-Sep-19	1-- the Canadian Rockies: <a href="#">fold-and-thrust belts</a> 2&3-- <b>How to make a Wikipedia page (bring your laptop to class) &amp; Wiki rubric draft</b> <i>READING 1 - Dahlstrom, 1969</i>
<b>WEEK 2</b> <i>Webb / Ali</i>	11-Sep-19	1-- the Canadian Rockies: <a href="#">fold-and-thrust belts</a> 2&3-- <b>How to draw in Inkscape (bring your laptop to class) &amp; Wiki rubric finalized</b>
	13-Sep-19	1-- Commonalities of the Alps, Taiwan, Variscan, Himalaya: <a href="#">tectonics and surface processes</a> 2-- Mini-lecture: how to make an evolutionary diagram (adv vs retr subd zones). <i>READING 2 - one of Montgomery and Stolar, 2006; Malavieille, 2010</i> <i>EXTRA (not required) READING - Webb, 2013</i>
		<b>DUE: SELECTION OF WIKI TOPIC, Turn in to Webb via email (25 points)</b>
<b>WEEK 3</b> <i>Ali</i>	18-Sep-19	<b>Welcome to East Asia!</b>
	20-Sep-19	<b>Welcome to East Asia! Here's how it works.</b> <b>Now is the time to do the hard work for your Wikipedia page.</b>
<b>WEEK 4</b> <i>Webb</i>	25-Sep-19	1-- From the western USA to Tibet: <a href="#">rifts, core complexes, extensional tectonics</a> 2-- Informal team presentation: how to explain an evolutionary diagram <i>READING 3 - one of Coney and Harms, 1984; Wernicke and Axen, 1988; Kapp et al., 2008</i> <i>EXTRA (not req.) READING - Lister &amp; Davis, 1989; McQuarrie &amp; Wernicke, 2005</i>
	27-Sep-19	<b>DUE: By this class, you must obtain approval for your Reading 4 / Exam 1 Part A paper.</b> 1-- <b>EXAM 1, Part A (30 points)</b> 2-- In-class exercise presenting chosen paper. <i>READING 4 - Student choice, each must choose a fully distinct paper that we will not otherwise read!</i>
<b>WEEK 5</b> <i>Webb / Ali</i>	02-Oct-19	1-- Hadley cells and the Andes, the Monsoon and the Himalaya: <a href="#">tectonics and climate</a> 2-- Informal team presentation: how to explain an evolutionary diagram <i>READING 5 - one of Montgomery et al., 2001; Clift et al., 2008; Boos and Kuang, 2010</i>
	04-Oct-19	<b>Welcome to East Asia! Here's how it works.</b>
<b>WEEK 6</b> <i>Webb / Ali</i>	09-Oct-19	The closure of the Tethyan Ocean: <a href="#">from mantle dynamics to climate</a> <i>READING 6 - one of Wortel &amp; Spakman, 2000; Kapp et al., 2007; Replumaz et al., 2010; 2014; DeCelles et al., 2011; Iaffaldano et al., 2011; Schildgen et al., 2014; Webb et al., 2017</i>
	11-Oct-19	<b>Welcome to East Asia! Here's how it works.</b>
	12-Oct-19	<b>DUE: WIKIPEDIA DRAFT PAGE turn in to Webb via email with link by noon (95 points)</b>
<b>WEEK 7</b>		Reading / field trip week: 14-19 October.
<b>WEEK 8</b> <i>Webb</i>	22-Oct-19	<b>DUE: Wikipedia (1) feedback and (2) reflection notes posted by noon (10 points)</b>
	23-Oct-19	<b>In-class Wikipedia feedback session</b>
	25-Oct-19	Odd regions: <a href="#">non-plate tectonics, salt tectonics, syntaxes, drips</a> <i>READING 7 - one of Saleeby and Foster, 2004; Hudec and Jackson, 2007; DeCelles et al., 2009; Yin and Taylor, 2011; Koons et al., 2013; Bendick &amp; Ehlers, 2014; Magni, 2019</i>
<b>WEEK 9</b> <i>Webb</i>	30-Oct-19	Tracking geological cooling: <a href="#">thermochronologic techniques</a> <i>READING 8 - Ault et al., 2019 in press Tectonics</i>
	01-Nov-19	<b>DUE: By this class, you must obtain approval for your Exam 1 Part B paper (READING 9).</b> 1-- <b>EXAM 1, Part B (30 points)</b> 2-- In-class exercise: thermochronology prediction experiment 1
<b>WEEK 10</b> <i>Webb</i>	06-Nov-19	LECTURE: Cooling histories and Himalayan tectonics: <a href="#">Tracking exhumation with thermochronology</a> DISCUSSION: Deep-mantle forcing of orogenesis <i>READING 10 - Faccenna et al., 2013 Tectonics; Faccenna et al., 2017 EPSL</i>
	08-Nov-19	In-class exercise: thermochronology prediction experiment 2
<b>WEEK 11</b> <i>Webb</i>	13-Nov-19	Barberton, Isua, Pilbara 1: <a href="#">lithologies and deformation patterns of early Earth</a> <i>READING 11 - one of Collins et al., 1998; Komiya et al., 1999; Van Kranendonk et al., 2019; Byerly et al., 2007; Nutman and Friend, 2009; Arai et al., 2015</i>
	15-Nov-19	In-class exercise: thermochronology prediction experiment 3.
	16-Nov-19	<b>DUE: Wikipedia page goes LIVE! Turn in via email with link by noon (75 points)</b>
<b>WEEK 12</b> <i>Webb</i>	19-Nov-19	<b>DUE: Wikipedia (1) feedback and (2) reflection notes posted by noon (10 points)</b>
	20-Nov-19	<b>In-class Wikipedia feedback session</b>
	22-Nov-19	Barberton, Isua, Pilbara 2: <a href="#">tectonic modes of early Earth</a> <i>READING 12 - one of Stern, 2008; Van Kranendonk, 2010; Moore &amp; Webb, 2013</i>
<b>WEEK 13</b> <i>Webb</i>	27-Nov-19	Regional to Planetary: could there be a unified theory of terrestrial planetary crusts? <i>READING 13 - Turcotte, 1989; Taylor and McLennan, 2009 [Chapter 1]; Moore et al., 2017</i>
	29-Nov-19	<b>DUE: By this class, you must obtain approval for your exam 2 paper (READING 14).</b> <b>EXAM 2 (60 points)</b>
<b>FINAL WIKI PROJECT DUE:</b>		<b>Noon, 19-Dec-19 (60 pts) + Reflection / feedback report (5 pts)</b>





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## EASC4407 REGIONAL GEOLOGY - 2019 Schedule version 1

<b>WEEK 1</b>	04-Sep-19	1-- Regional Geology: Topics, Solving Problem: <i>Webb</i>	
	06-Sep-19	2-- <b>Introduction to Wikipedia Project</b> 1-- the Canadian Rockies: <u>fold-and-thrust belts</u> 2&3-- <b>How to make a Wikipedia page (bring your laptop to class) &amp; Wiki rubric draft</b> <i>READING 1 - Dahlstrom, 1969</i>	
<b>WEEK 2</b>	11-Sep-19	1-- the Canadian Rockies: <u>fold-and-thrust belts</u> <i>Webb / Ali</i>	
	13-Sep-19	2&3-- <b>How to draw in Inkscape (bring your laptop to class) &amp; Wiki rubric finalized</b> 1-- Commonalities of the Alps, Taiwan, Variscan, Himalaya: <u>tectonics and surface processes</u> 2-- Mini-lecture: how to make an evolutionary diagram (adv vs retr subd zones). <i>READING 2 - one of Montgomery and Stolar, 2006; Malavieille, 2010</i> <i>EXTRA (not required) READING - Webb, 2013</i>	
<b>DUE:</b>		<b>SELECTION OF WIKI TOPIC, Turn in to Webb via email (25 points)</b>	
<b>WEEK 3</b>	18-Sep-19	<b>Welcome to East Asia!</b>	<b>Now is the time to do the hard work for your Wikipedia page.</b>
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<b>DUE:</b>		<b>By this class, you must obtain approval for your Reading 4 / Exam 1 Part A paper.</b>	
	27-Sep-19	1-- <b>EXAM 1, Part A (30 points)</b> 2-- In-class exercise presenting chosen paper. <i>READING 4 - Student choice, each must choose a fully distinct paper that we will not otherwise read!</i>	

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WIKI PAGE

EASC4407 REGIONAL GEOLOGY - 2019 Schedule version 1

WEEK 1 04-Sep-19

*Webb*

1-- Regional Geology: Topics, Solving Problem:

2-- **Introduction to Wikipedia Project**

1-- ~~the Canadian Rockies: fold and thrust belts~~

2&3-- **How to make a Wikipedia page (bring your laptop to class) & Wiki rubric draft**

READING 1 - *Dahlstrom, 1969*

1-- the Canadian Rockies: fold-and-thrust belts

2&3-- **How to draw in Inkscape (bring your laptop to class) & Wiki rubric finalized**

1-- Commonalities of the Alps, Taiwan, Variscan, Himalaya: tectonics and surface processes

2-- Mini-lecture: how to make an evolutionary diagram (adv vs retr subd zones).

READING 2 - *one of Montgomery and Stolar, 2006; Malavieille, 2010*

EXTRA (not required) READING - *Webb, 2013*

**DUE:** SELECTION OF WIKI TOPIC, Turn in to Webb via email (25 points)

WEEK 3 18-Sep-19

*Ali*

**Welcome to East Asia!**

**Now is the time to do the hard work**

**Welcome to East Asia! Here's how it works.**

**for your Wikipedia page.**

WEEK 4 25-Sep-19

*Webb*

1-- From the western USA to Tibet: rifts, core complexes, extensional tectonics

2-- **Informal team presentation: how to explain an evolutionary diagram**

READING 3 - *one of Coney and Harms, 1984; Wernicke and Axen, 1988; Kapp et al., 2008*

EXTRA (not req.) READING - *Lister&Davis, 1989; McQuarrie&Wernicke, 2005*

**DUE:** **By this class, you must obtain approval for your Reading 4 / Exam 1 Part A paper.**

27-Sep-19

1-- **EXAM 1. Part A (30 points)**

2-- **In-class exercise presenting chosen paper.**

READING 4 - **Student choice**, each must choose a fully distinct paper that we will not otherwise read!



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# ONLINE PEDAGOGY WIKIPEDIA

## Chat CL4.17

SHIFT+ENTER for line break

Current number of users in the chat: 6

A A A Exit full screen

Philippe Courtial - EGU Office (14:52) Hi everyone, I am looking forward to participating in this exciting session.

Susanne Buitter RWTH Aachen (convener) (14:52)  
We will discuss the displays in order of appearance (see the box to the right). Each author is asked for a 1-2 sentence introduction (please prepare!). Then we will take questions.

P. van der Beek, Univ. Grenoble, Author (14:52) Hi all, I'm the author of Display D3899 and am excited to present this work

Susanne Buitter RWTH Aachen (convener) (14:52) As conveners we have prepared overarching questions based on the displays for an open discussion at the end of the chat.

Hazel Gibson, EGU Office (14:52) Hello everyone, I am looking forward to this chat!

Terri Cook (14:52) Me too!

**B** *I*  $\times_2$   $\times^2$  ↶ ↷

SHIFT+ENTER for line break



- Show user list (6)
- All abstracts
- Abstracts with presentations (10)

Chat time: 14:00–15:45

D3883 | EGU2020-15589

[Climate change in mountains around the globe: Elevation dependencies and contrasts to adjacent lowla\[...\]](#)

Enrico Arnone et al.

D3884 | EGU2020-18274

[Detection of precipitation and snow cover trends in the the European Alps over the last century usin\[...\]](#)

Julien Beaumet et al.

D3885 | EGU2020-15536

[Investigating the anthropogenic influence on the mesoscale over Kilimanjaro](#)

Carolyne Pickler and Thomas Mölg

D3886 | EGU2020-16856

[Impactful Tibetan Plateau Vortices: structure, lifecycle and environmental conditions](#)

Julia Curio et al.

D3887 | EGU2020-1329

[The impact of the Westerlies on the PBL growth and land surface energy balance on the north of the c\[...\]](#)

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# Communication Intensive Courses

**CIC CERTIFICATION** ➔



A wide-angle landscape photograph showing a massive glacier flowing down a rocky, brownish-grey slope. The glacier's surface is textured with numerous crevasses and ridges, appearing in shades of white and light blue. In the middle ground, a calm, greyish-blue lake is visible, reflecting the sky. The background consists of rugged, dark mountains with patches of snow or ice. The sky is a clear, bright blue. The text 'COMMUNICATIONS-INTENSIVE COURSES' is overlaid in white, bold, italicized capital letters across the upper middle portion of the image.

***COMMUNICATIONS-INTENSIVE COURSES***

# COMMUNICATIONS-INTENSIVE COURSES

## WHAT ARE CI-BADGED COURSES?

CI-badged courses are courses that consist of a syllabus with components that explicitly develop students' communication-related:



### *knowledge*

understanding of communication as it relates to human interaction



### *skills*

skills in communicating effectively with others, using language and/or other means



### *attributes*

the attributes of effective communicators

*COMMUNICATIONS-INTENSIVE COURSES*

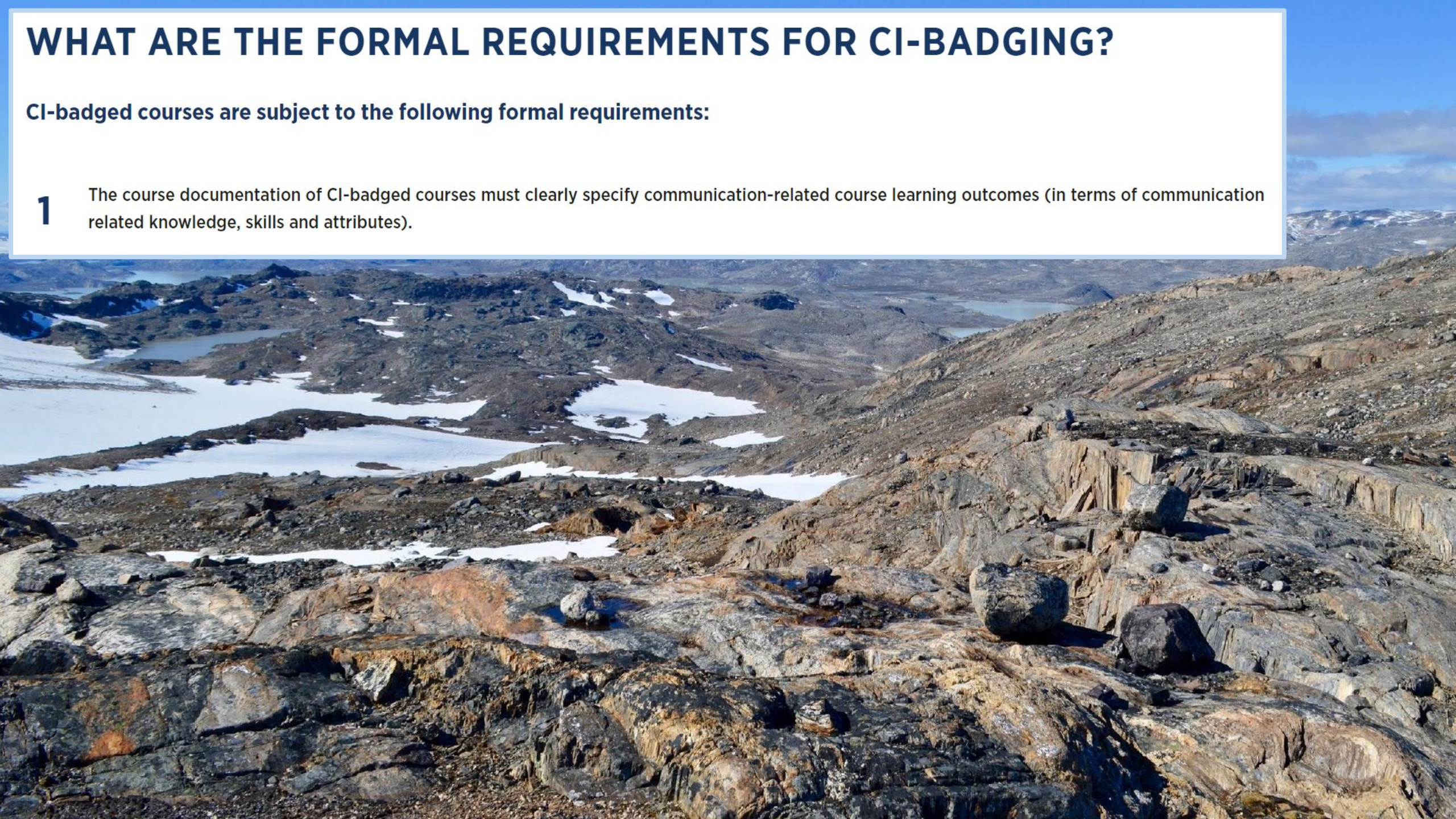


# WHAT ARE THE FORMAL REQUIREMENTS FOR CI-BADGING?

CI-badged courses are subject to the following formal requirements:

1

The course documentation of CI-badged courses must clearly specify communication-related course learning outcomes (in terms of communication related knowledge, skills and attributes).



# WHAT ARE THE FORMAL REQUIREMENTS FOR CI-BADGING?

2 CI-badged course learning outcomes must include learning outcomes that relate specifically to at least two of the following four communication 'literacies':



## ORAL LITERACY

The ability to communicate through spoken texts that are constructed with the appropriate content, structure and language features, fit for their intended academic or professional purpose and audience.



## WRITTEN LITERACY

The ability to communicate through written texts that are constructed with the appropriate content, structure and language features, fit for their intended academic or professional purpose and audience.



## VISUAL LITERACY

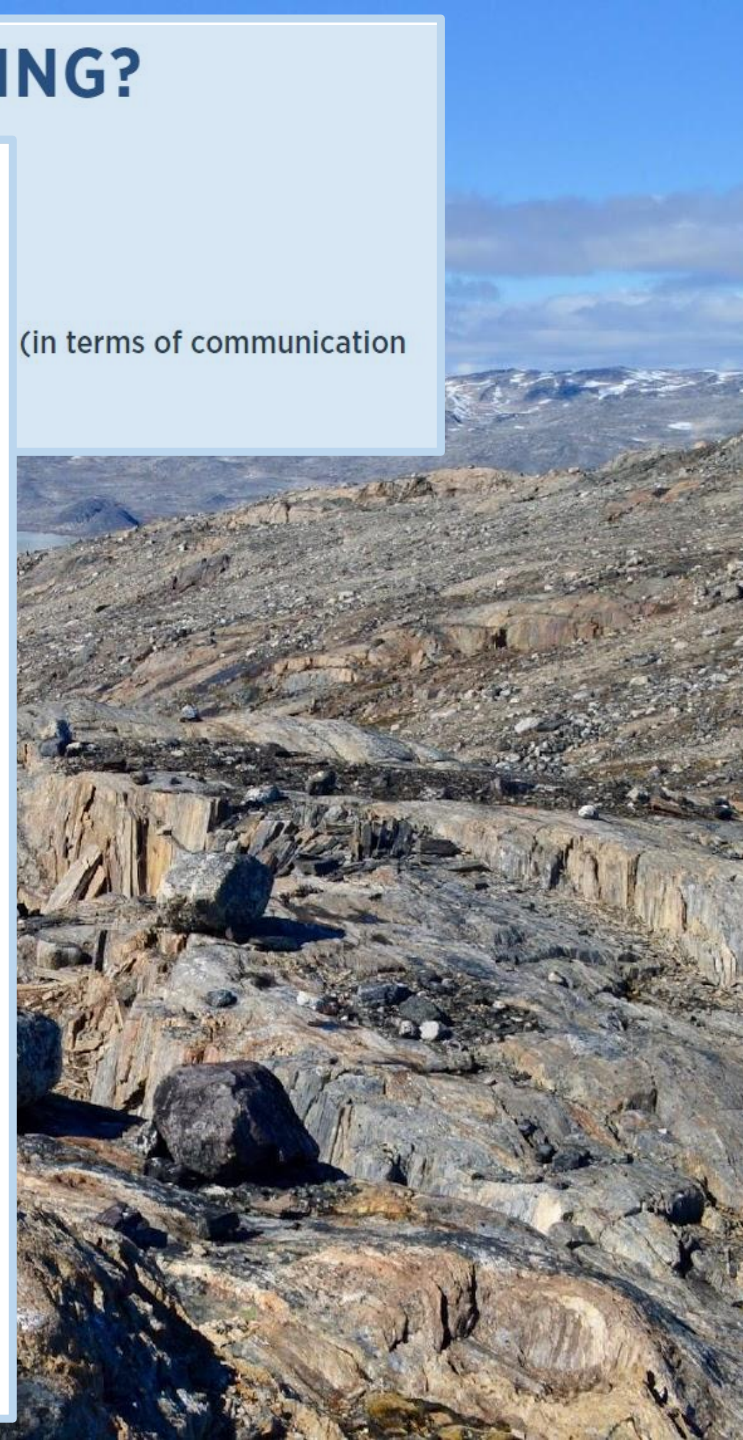
The ability to communicate in speech and writing through appropriate visual modes (e.g., diagrams, graphs, charts) and/or visual media (e.g., posters, 3-D printed objects, stage performances).



## DIGITAL LITERACY

The ability to use appropriate information and communication technologies to find, evaluate, create, and communicate information in speech and writing (e.g., wikis, websites, virtual reality projects).

(in terms of communication



# WHAT ARE THE FORMAL REQUIREMENTS FOR CI-BADGING?

2

CI-badged course learning outcomes must include learning outcomes that relate specifically to at least two of the following four communication 'literacies':



## ORAL LITERACY

The ability to communicate through spoken texts that are constructed with the appropriate content, structure and language features, fit for their intended academic or professional purpose and audience.



## WRITTEN LITERACY

3

At least **40% of the course grade** of a CI-badged course must be assigned to communication-rich assessment tasks relating specifically to communication-related knowledge, skills and attributes, as specified in the course learning outcomes. **Assessment rubrics** must be provided that describe expected student performance in these communication-rich assessment tasks.



## VISUAL LITERACY

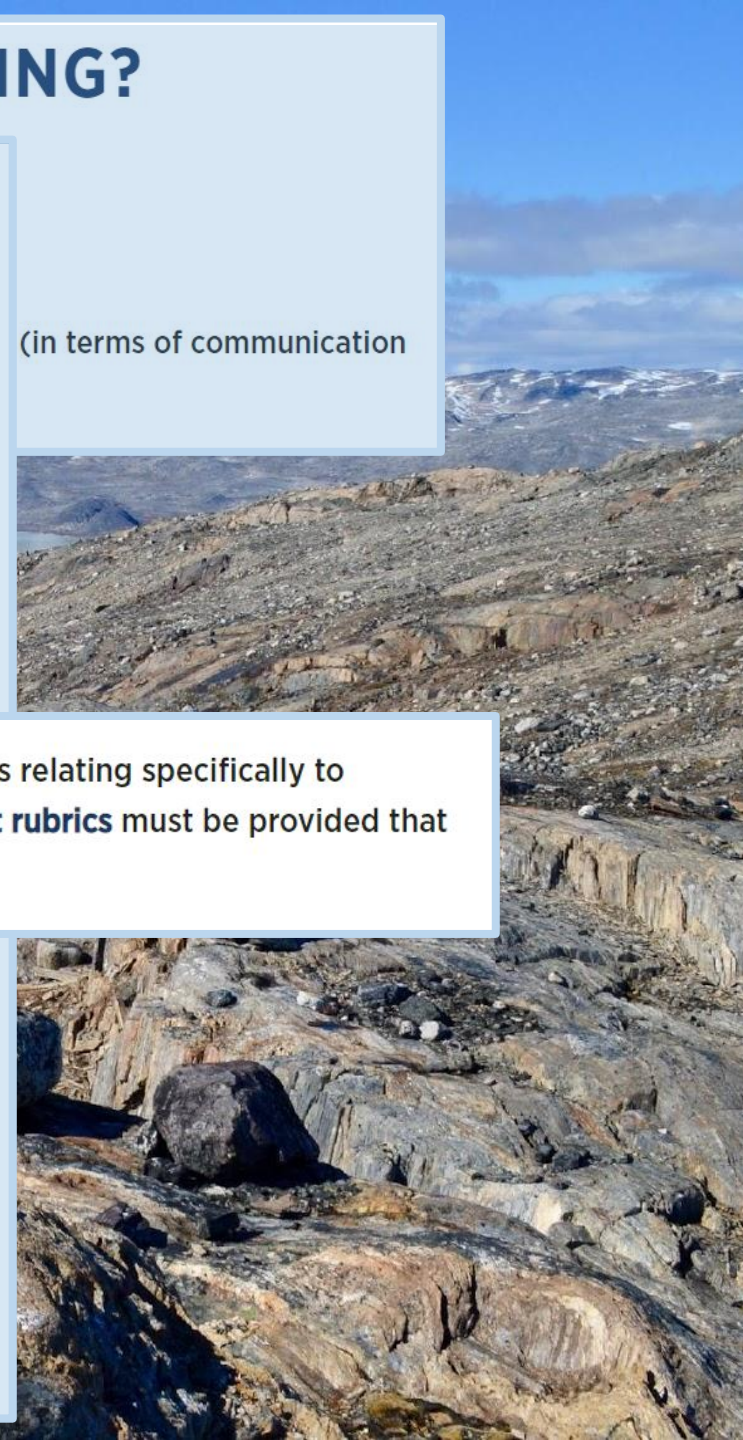
The ability to communicate in speech and writing through appropriate visual modes (e.g., diagrams, graphs, charts) and/or visual media (e.g., posters, 3-D printed objects, stage performances).



## DIGITAL LITERACY

The ability to use appropriate information and communication technologies to find, evaluate, create, and communicate information in speech and writing (e.g., wikis, websites, virtual reality projects).

(in terms of communication



An aerial photograph of a vast, rugged landscape. In the foreground, a wide, snow-covered slope descends from the left towards the center. The middle ground features a series of dark, rocky mountain ridges and valleys, with patches of snow clinging to the slopes. A large, calm body of water, likely a fjord, stretches across the middle distance, surrounded by more mountains. In the far background, a range of snow-capped mountains is visible under a bright blue sky filled with large, white, fluffy clouds. The overall scene is one of a high-altitude, mountainous region.

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***COMMUNICATIONS-INTENSIVE COURSES***



***Eike Schling***



***HKU Architecture***



***COMMUNICATIONS-INTENSIVE COURSES***



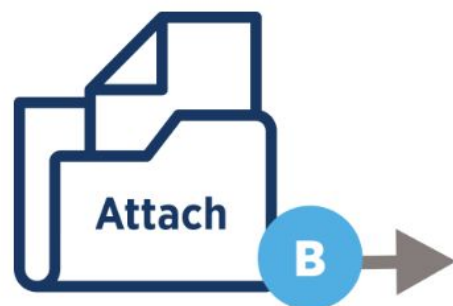
## COMMUNICATIONS-INTENSIVE COURSES

### STAGE 1

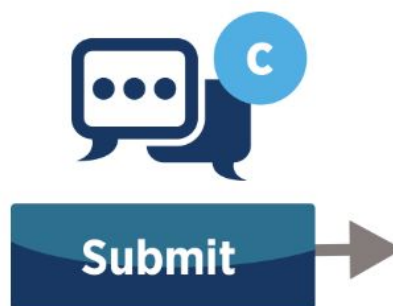
#### CiC Committee endorsement of CiC certification application



- 1 Download C-I certification form
- 2 Complete the form



- 1 C-I certification Form
- 2 Course syllabus, grade descriptors and assessment rubrics



Contact the CiC Committee



Wait for feedback and endorsement from CiC Committee

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Thank you, keep in touch!  
[aagwebb@hku.hk](mailto:aagwebb@hku.hk)

P.S. This is Isua, SW Greenland.  
Geosciences: explore your world.