



Indian Institute of Technology, Kanpur

Department of Earth Sciences

ES0213A: Fundamentals of Earth Sciences

Lecture 01. Course Introduction

Santanu Misra

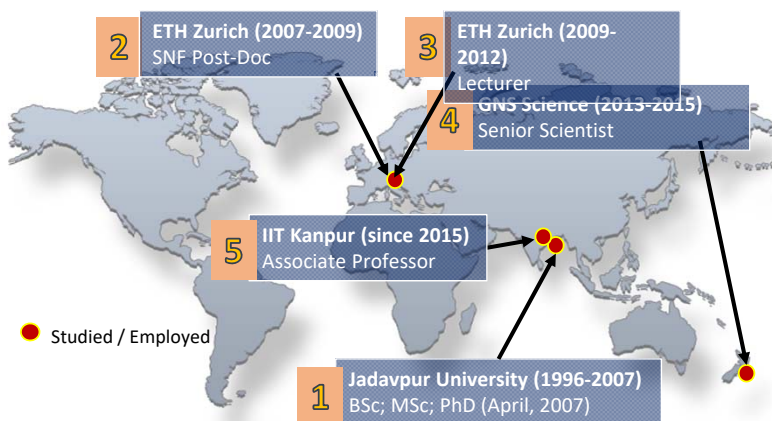
Department of Earth Sciences

Indian Institute of Technology, Kanpur

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Your Instructor



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Experimental Rock Mechanics / Rock Physics

- Strength, failure mechanism and mechanical anisotropy.
- Fracture Mechanics related to Earthquake generation.
- Experimental wave-propagation, micro-seismicity.
- Porosity, permeability and fluid flow.

Structural Geology / Tectonics

- Tectono-Metamorphic evolution of Subduction interface.
- Fluid flow during crustal deformation.
- Microstructure / Texture analysis.

Teaching Assistants



Mr. Abinash Bal

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Joined IIT Kanpur in 2018

M. Sc. 2018, IIT Bombay, Maharashtra



Mr. Anamitra Sikdar

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Joined IIT Kanpur in 2019

M. Sc. 2018, Jadavpur University, Kolkata

About You



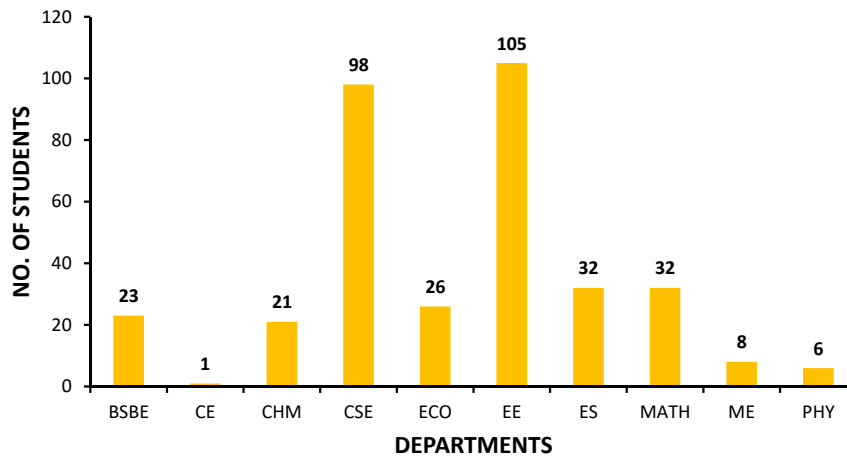
A teacher doesn't like a class without any student in the classroom. This is a changed time... anyway. Let's learn ONLINE !

- All of you must be *exceptionally sharp*!
- If you're worried about whether you can handle the class.... Relax !!
- Many of you are here to fulfill the "ESO" course requirement in your template, and therefore, not very serious about the learning. That's OK!
- There is no such thing as a "science student" vs. a "non-science student (engineering)"! You were BORN curious – which is what science really is all about – investigating the world.

Class Statistics



Total Number of Students: 352



Y19 : 302

Y18 : 47

Y17 : 1

Y16 : 1

Y14 : 1

First Assignment (ungraded)



Please see the Google form uploaded/shared in the class mail

- ☐ Your Name
- ☐ Your Roll Number
- ☐ Your Department
- ☐ The reason(s) for registering the class
- ☐ What surprises you most about the Earth?
- ☐ What is the craziest thing you have ever done so far?
- ☐ What is(are) the place(s) in Earth that you wish to travel one day?

<https://forms.gle/t6XqMhR45sP4UCdb9>

You MUST submit the form on or before 5th September, 2020; 11:55 PM

Class Management



Please go through the following links for the general instructions:

IITK Senate Decisions:

https://www.iitk.ac.in/doaa/data/senate_decisions_implementation_2020_21_1.pdf

FAQ about the courses:

https://www.iitk.ac.in/doaa/data/senate_decisions_implementation_2020_21_1.pdf

Technical requirements:

https://www.iitk.ac.in/doaa/data/Technical_Infrastructure_Requirements.pdf

Class Management



- Online classes
- The primary teaching platform is: <https://hello.iitk.ac.in>. [any alteration of this platform will be communicated to you well in advance].
- Pre-recorded lectures of ~90-110 mins/week will be uploaded on Friday of the previous week. Individual lectures will be of short duration.
- The lecture presentations (.pdf) and other related study-materials will also be uploaded in the online platform.
- There will be one or more discussion (interaction) sessions/week as per the schedule in the time table. We shall use Zoom online platform for the discussion.
- All assignments/quizzes will be conducted online

Scheme of the Grades



Discussions

(your participations in the discussions, overall engagement including attendance)

10%

Assignments and Quizzes

(Best 70% of your assignments and 100% of the quizzes)

25%

Mid Semester Examination (Online)

(MCQ; Short conceptual Questions – Open Book)

25%

End Sem Examination (Online)

(MCQ; Short conceptual Questions – Open Book)

40%

If you cannot follow the lectures because of sickness, poor internet connections or for any other reasons, please contact me ASAP.

Policies on Cheating and Ethics



Cheating in any form is NOT ALLOWED.

If a student cheats or uses unfair means in a course,

- The student will get an **F** grade in the course.
- The student cannot drop the course.
- DUGC of the concerned department will be informed
- A complaint will be sent to SSAC for action.

<https://web.iitk.ac.in/july14dosa/data/SSAC-procedures-and-Guidelines.pdf>

Content of this lecture-series



Solar System and Earth; The primitive Earth; Geological Time scale; Origin of life and major geological events; Numerical Dating. Rocks, minerals and soils; Plate Tectonics and Mountain building; Deformation and Geodynamics; Earthquakes, Volcanoes. Earth, Ocean, Land, Rivers, Atmosphere, Biosphere, Cryosphere and Climate; Energy budget; Carbon Cycle; Hydrological Cycle; Weathering and erosion. Coupled processes in Earth System; climate change, Geological resource (minerals, hydrocarbons and water); Sustainability and Anthropocene activities.

General TIME TABLE



Orientation Programme for All New MSc 2-yr, MS-PD, and PG Students	Aug 26, 2020
Registration and Fee Payment for All New Students in the MTech, MDes, MSR, MBA, MSc 2-Yr, MS-PD and PhD Programmes	Aug 27-28, 2020
Registration and Fee Payment for Continuing Students in all Programmes	Aug 29-30, 2020
Late Registration	Sep 5, 2020
Classes and Add/Drop Schedule	
Release of First Course Handout	Aug 29-30, 2020
Online Classes Commence	Sept 1, 2020
Adding a Course	Sept 1-7, 2020
Dropping/De-registering Modular Courses (First Half)	Sept 26, 2020
Classes for the Modular Courses (First Half) End	Oct 10, 2020
Classes for Modular Courses (Second Half) Commence	Oct 19, 2020
Last date for Dropping Regular Courses	Oct 31, 2020
Last date for De-registration in Regular Courses	Nov 7, 2020
Dropping/De-registering Modular Courses (Second Half)	Nov 16, 2020
Online Classes End	Nov 30, 2020
Academic Pre-registration (2020-21-II)	
Academic Pre-registration for 2020-21-II	Nov 16-23, 2020
Examinations and Grade Submission	
Mid-Semester Examination (Online)	Oct 12-18, 2020
End Semester Examination (Online)	Dec 3-12, 2020
Make-up Examination (Online)	Dec 16-19, 2020
Last date for End Semester Grade Submission	Dec 20, 2020
Last date for Make-up Grade Submission and Conversion of I Grades	Dec 22, 2020
Vacation	

Class TIME TABLE



Weeks	Dates	GENERAL TOPICS
Week_01	Sept 01- Sept 04	General Introductions
Week_02	Sept 07 - Sept 11	Earth as a System and Principles [QUIZ - I]
Week_03	Sept 14 - Sept 18	Plate Tectonics
Week_04	Sept 21 - Sept 25	Minerals and Rocks [QUIZ - II]
Week_05	Oct 05 - Oct 09	Deformation of Rocks
Week_06	Oct 12 - Oct 16	MID SEMESTER EXAMINATION
Week_07	Oct 19 - Oct 23	History of the Earth and Time Scale
Week_08	Oct 26 - Oct 30	Earth's interior [QUIZ - III]
Week_09	Nov 02 - Nov 06	Natural Hazards (Earthquakes, Volcanisms)
Week_10	Nov 09 - Nov 13	Climate and Atmosphere
Week_11	Nov 16 - Nov 20	Landforms, Weathering and Erosion [QUIZ - IV]
Week_11	Nov 26 - Nov 30	Earth's resources (water, minerals, hydrocarbons) and Human Impact
Week_12	Dec 3 - Dec 12	END SEMESTER EXAMINATION

Tentative Class TIME TABLE



Weeks	Dates	GENERAL TOPICS
Week_01	Sept 01- Sept 04	General Introductions
Week_02	Sept 07 - Sept 11	Earth as a System and the Principles of Earth
Week_03	Sept 14 - Sept 18	Plate Tectonics
Week_04	Sept 21 - Sept 25	Minerals and Rocks
Week_05	Sept 28 - Oct 02	Deformation of Rocks (Strain & Stress)
Week_06	Oct 05 - Oct 09	Basic Structures of Rocks
Week_07	Oct 12 - Oct 18	MID SEMESTER EXAMINATION
Week_08	Oct 19 - Oct 23	History of the Earth and Time Scale
Week_09	Oct 26 - Oct 30	Earth's interior
Week_10	Nov 02 - Nov 06	Natural Hazards (Earthquakes, Volcanisms and others)
Week_11	Nov 09 - Nov 13	Climate and Atmosphere
Week_11	Nov 16 - Nov 20	Landforms, Weathering and Erosion
Week_12	Nov 23 - Nov 27	Earth's resources (water, minerals, hydrocarbons) and Human Impact
Week_13	Dec 3 - Dec 12	END SEMESTER EXAMINATION

4-5 Quizzes; shall announce the dates on the 2nd week

Summary of this lecture



This is a large class with students from various disciplines.

Please respect the conduct of the course and your colleagues.

The course is being offered online, which is a new platform to all of us. Be patient, please, if there is any technical fault.

Participate in the course and respond timely.