

**Department of Earth Sciences
Indian Institute of Technology Kanpur**

Course Title: Fundamentals of Earth Sciences

Course Number: ES 213A

Instructor: Indra S. Sen (isen@iitk.ac.in; office: Western Lab Extension-201)

Lecture Schedule: MWF (10:00-11:00)

TAs: Soumita Boral (soumita@iitk.ac.in); Sohini Bhattacharya (sohini@iitk.ac.in); Dipro Sarkar (dipro@iitk.ac.in); Smruti Ranjan Patra (Smruti@iitk.ac.in); Ansari Abdullah (ansariaa@iitk.ac.in)

- **If you have any questions related to the course, please contact any of the TAs. If confusion still persists, contact me.**

Course Description: The course will provide an introduction to how the planet Earth has evolved the way it is now with all its physico-chemical properties and measurable characteristics. A student with an intention of majoring in Earth Sciences should mark his/her journey with this course. If otherwise, the lectures will widen the interests of students from any other discipline in understanding and appreciating the natural mechanisms including, deep Earth, environmental, and climate change issues.

Course Content:

Date	Day	Topics (tentative)
31-Jul	Mon	Why would you study Earth Science?
02-Aug	Wed	Origin of Earth and building block of our planets.
04-Aug	Fri	Internal Structure of Earth
07-Aug	Mon	Plate Tectonics
09-Aug	Wed	Divergent Boundaries
11-Aug	Fri	Convergent Boundaries
14-Aug	Mon	Magma and Igneous Rocks “Granites”
16-Aug	Wed	Intrusive Activities and Volcanoes
18-Aug	Fri	Metamorphic rocks “Marbles”
21-Aug	Mon	Sedimentary rocks “Coal and Petroleum”
23-Aug	Wed	Quiz 1 , followed by Weathering and Soil
25-Aug	Fri	Earth’s history and Geological Time Scale
28-Aug	Mon	Earth’s history and Geological Time Scale (Radioactive Dating)
30-Aug	Wed	Radioactive Dating continued...
01-Sep	Fri	Crustal Deformation
04-Sep	Mon	Earthquakes
06-Sep	Wed	Quiz 2 , followed by Hydrological Cycles
08-Sep	Fri	Rivers
11-Sep	Mon	Ocean (31 July-8 Sept mid semester syllabus)
13-Sep	Wed	Groundwater
15-Sep	Fri	Groundwater continued...
<i>18-Sep</i>	<i>Mon</i>	Mid Semester exam (Sept 18 to Sept 23) syllabus up to 11th September 2017
<i>20-Sep</i>	<i>Wed</i>	
<i>22-Sep</i>	<i>Fri</i>	

<i>25-Sep</i>	<i>Mon</i>	Mid Semester exam (Sept 24 to Oct 2)
<i>27-Sep</i>	<i>Wed</i>	
<i>29-Sep</i>	<i>Fri</i>	
<i>02-Oct</i>	<i>Mon</i>	
04-Oct	Wed	Glaciers
06-Oct	Fri	Climate Change
09-Oct	Mon	Climate Change continued
11-Oct	Wed	Earth's Surface Processes
13-Oct	Fri	Deserts and winds
16-Oct	Mon	Natural Hazards
<i>18-Oct</i>	<i>Wed</i>	Diwali Break
<i>20-Oct</i>	<i>Fri</i>	Diwali Break
23-Oct	Mon	Quiz 3 (8 Sept to 13 Oct)
25-Oct	Wed	Atmosphere
<i>27-Oct</i>	<i>Fri</i>	Antaragini(Possibly holiday)
30-Oct	Mon	Earth Resources
01-Nov	Wed	Mineral Deposits and igneous processes
03-Nov	Fri	Conventional Hydrocarbon Resources
06-Nov	Mon	Conventional Hydrocarbon Resources continued
08-Nov	Wed	Quiz 4 (23 Oct to 6 Nov)
10-Nov	Fri	Unconventional Hydrocarbon Resources
13-Nov	Mon	Geology of other Planets
15-Nov	Wed	Revision

Class Policies

(1) Textbook and reading:

Please follow the power point presentations and lecture notes from class. Time to time, additional materials in the form of chapter and papers will be given as reading material. You can also consult the following books

1. E. J. Tarbuck, F. K. Lutgens and D. G. Tasa. Earth: An Introduction to Physical Geology, 2013 (11th Ed.). Prentice Hall. 912 p.
2. D. R. Prothero and R. H. Dott, Jr. Evolution of the Earth. 2010 (8th Ed.), McGraw Hill, 576 p.
3. J. Grotzinger and T. Jordan, Understanding Earth, 2010 (6th Ed.). Freeman, 710 p.

(2) Attendance:

Attendance at lectures is extremely important, however, I won't enforce. But remember, exams are based on material presented in lectures.

(3) Exams:

I will follow the system of Relative Grading. Marks will be distributed as per the table -

<i>Quiz</i>	<i>30 points</i>
<i>Mid Term</i>	<i>30 points</i>
<i>Final Term</i>	<i>40 points</i>

There will 4 announced quizzes that make up 30% of your grade. Out of the 4 quizzes, the best 3 will be taken towards your grade. Don't miss your quizzes, as there will be no make up quizzes. Quizzes will be an open book; notes and you are free to use the Internet as well. Your mid-term and final term will cover 30% and 40% of your grade. Remember, both mid and final term will be closed book examination.

(4) Courtesy to your fellow students:

Please arrive for class on time and *set your cell phones on silent* before the class begins.

Good Luck!