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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------|----------------------------|---------------------------------------------------------------|----------------------|
| <b>Course number</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  | U-LAS15 20007 LE58                                                         |                                  |                                                                    |                            |                                                               |                      |
| <b>Course title<br/>(and course title in English)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                  | Introduction to Engineering Geology<br>Introduction to Engineering Geology |                                  | <b>Instructor's name, job title, and department of affiliation</b> |                            | Graduate School of Engineering<br>Associate Professor,Zhu Fan |                      |
| <b>Group</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Natural Sciences |                                                                            | <b>Field(Classification)</b>     |                                                                    | Earth Science(Development) |                                                               |                      |
| <b>Language of instruction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | English          |                                                                            | <b>Old group</b>                 | Group B                                                            |                            | <b>Number of credits</b>                                      | 2                    |
| <b>Number of weekly time blocks</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1                | <b>Class style</b>                                                         | Lecture<br>(Face-to-face course) |                                                                    | <b>Year/semesters</b>      | 2026 • Second semester                                        |                      |
| <b>Days and periods</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Tue.5            |                                                                            | <b>Target year</b>               | Mainly 2nd year students                                           |                            | <b>Eligible students</b>                                      | For science students |
| <b>[Overview and purpose of the course]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <p>Geology comes from the Greek geo, "Earth", and logos, "discourse". This class provides a basic knowledge of our planet's components (matter, minerals, rocks, etc.) and their main processes (mineral formation, plate tectonics, volcanic activity, earthquakes, etc.) from the viewpoint of engineering.</p> <p>The correct understanding of the Earth and its many interacting parts, in different physical and time scales, using the basic knowledge and principles of geology, will help us confirm that all important geological factors are adequately considered when designing, constructing, and operating engineering works.</p>                                                          |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <b>[Course objectives]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| By the end of the semester, you should have a basic knowledge of geology, and be able to think about its application when designing, constructing, and operating engineering works.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <b>[Course schedule and contents)]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <p>This course consists of 15 classes including one feedback class. The main topics are:</p> <ol style="list-style-type: none"> <li>1. Guidance, introduction to Earth science</li> <li>2. Plate tectonics</li> <li>3. Matter and minerals</li> <li>4. Igneous rocks, volcanic activity</li> <li>5. Weathering, sedimentary rocks</li> <li>6. Metamorphism, metamorphic rocks</li> <li>7. Principles of relative dating and numerical dating</li> <li>8. Mountain building process</li> <li>9. Earthquakes and crustal deformation</li> <li>10-12. Geologic structures and mapping</li> <li>13. Surface water and groundwater</li> <li>14. Energy and mineral resources</li> <li>15. Feedback</li> </ol> |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <b>[Course requirements]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <b>[Evaluation methods and policy]</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <p>Grading will be based on performance during regular classes (such as in-class exercise and homework) (30%) and a final exam (70%). Details will be explained in class.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |
| <div style="text-align: right;">Continue to Introduction to Engineering Geology(2) ↓ ↓ ↓</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |                                                                            |                                  |                                                                    |                            |                                                               |                      |

## Introduction to Engineering Geology(2)

### [Textbooks]

Not used

### [References, etc.]

#### (References, etc.)

Edward J. Tarbuck, Frederick K. Lutgens 『Earth - An Introduction to Physical Geology』 ISBN: 9780321814067

Stephen Marshak 『Essentials of Geology』 ISBN:9780393919394

Edward A. Keller 『Introduction to Environmental Geology』 ISBN:9780132251501

Lee R. Kump, James F. Kasting, Robert G. Crane 『The Earth System』 ISBN:9780321597793

Brian J. Skinner, Barbara Murck 『The Blue Planet : An Introduction to Earth System Science』 ISBN: 9780471236436

Kent C. Condie 『Earth as an Evolving Planetary System』 ISBN:9780123852274

All reference books are available at the Library of the School of Global Engineering, at the Main Yoshida Campus Library, and/or at other Kyoto University libraries. Previous editions of the same books can also be used.

### [Study outside of class (preparation and review)]

Assignment may be given after a class and students are expected to complete the assignment before the next class.

### [Other information (office hours, etc.)]

Consultation arrangement will be provided during the first lecture.

### [Essential courses]

Faculty of Science