

Hokkaido University Syllabus

<p>■ ■ Course Title</p> <p>Mineral Processing and Resources Recycling</p>					
<p>■ ■ Subtitle</p>					
<p>■ ■ Instructor (Institution)</p> <p>Mayumi ITO(Graduate School of Engineering)</p>					
<p>■ ■ Other Instructors (Institution)</p> <p>Mayumi ITO(Graduate School of Engineering)</p>					
<p>■ ■ Course Type</p>				<p>■ ■ Open To Other Faculties / Schools</p>	OK
<p>■ ■ Year</p>	2017	<p>■ ■ Semester</p>	1st Semester (Summer Term)	<p>■ ■ Course Number</p>	092850
<p>■ ■ Type of Class</p>	Lecture	<p>■ ■ Number of Credits</p>	2	<p>■ ■ Year of Eligible Students</p>	~
<p>■ ■ Eligible Department / Class</p>				<p>■ ■ Other Information</p>	
<p>■ ■ Numbering Code</p>	ENG 5961				
<p>■ ■ Major Category Code</p>	<p>■ ■ Major Category Title</p> <p>ENG Engineering</p>				
<p>■ ■ Level Code</p>	<p>■ ■ Level</p> <p>5 Specialized Subjects (basics) in graduate level (Master's Course and Professional Course), Inter-Graduate School Classes</p>				
<p>■ ■ Middle Category Code</p>	<p>■ ■ Middle Category Title</p> <p>9</p>				
<p>■ ■ Small Category Code</p>	<p>■ ■ Small Category Title</p> <p>6</p>				
<p>■ ■ Language Type</p> <p>Classes are in English.</p>					

■ ■ Key Words

physical separation, mineral processing, solid waste, recycling

■ ■ Course Objectives

This course outlines the principle of physical separation methods used in mineral processing and resources recycling first and then shows their equipments and process. Details of plants and potential usage of the separation methods are also introduced.

■ ■ Course Goals

It is expected that conducting of the course work will enable you to obtain ability to explain fundamental knowledge of crushing and separation methods used in mineral processing and resource recycling.

■ ■ Course Schedule

(1) Introduction (1 time)

The role of mineral processing in utilization of ore and solid waste

(2) Size reduction and size separation (3 times)

a) Comminution b) Crushers c) Grinding mills d) Industrial screening d) Classification

(3) Sorting (1 time)

a) Photometric sorting b) Radioactive sorting c) Color sorting

(4) Dense medium separation (2 times)

a) Dense medium b) Gravitational vessels c) Centrifugal separators d) DMS circuits

(5) Gravity separation (2 times)

a) Jigs b) Pinched sluices and cones c) Spirals d) Shaking Tables e) Centrifugal concentrators

(6) Magnetic separation and electrostatic separation (2 times)

a) Principles b) Low-intensity magnetic separators c) High-intensity magnetic separators

d) High gradient magnetic separators e) Superconducting separators f) High-tension separators

(7) Flotation (3 times)

a) Principles b) Collectors c) Frothers d) Regulators e) Flotation machines

f) Flotation circuits g) Plant practice

(8) Recycling plant practice (1 time)

#### ■ ■ Homework

Students need to spent about five hours per week for assignments, preparation, and lecture review.

#### ■ ■ Grading System

Grades are determined based on quizzes (75%), and reports (25%)

#### ■ ■ Textbooks

There is no one text that adequately responds to the goals and topics of this lecture. Some readings and handouts will be prepared for you. Please contact the instructor if you need further advice.

#### ■ ■ Reading List

[Wills' Mineral Processing Technology, Seventh Edition / Barry A. Wills : Butterworth-Heinemann, 2006, ISBN:978-0750644501](#)  
[Principles of Mineral Processing / Edited by Maurice C. Fuerstenau, Kenneth N. Han : SME, 2003, ISBN:0873351673](#)  
[Mineral Processing Design and Operation / A. Gupta and D.S. Yan : Elsevier, 2006, ISBN:978-0-444-51636-7](#)

#### ■ ■ Websites

#### ■ ■ Website of Laboratory

<http://mp-er.eng.hokudai.ac.jp/indexjp.htm>

#### ■ ■ Additional Information

#### ■ ■ Update

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