No.	459.730	Subject	Physicochemical Analysis of Earth Materials	credit	3

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Object	The main purpose of this class is to study the advanced theories and methods of physicochemical and optical analysis of earth materials such as solid geochemical specimens of rocks, minerals, soils and sediments. This class covers sample preparation and decomposition methods, optical properties and identification methods of rocks and minerals by transmitted- and reflected-light microscope, the theory and method of EPMA (electron probe microanalysis) and SEM (scanning electron microscope) analysis, X-ray diffraction and differential thermal analysis, X-ray using instrumental analysis technics such as X-ray fluorescences, and case histories of physicochemical and optical analysis of earth materials.

References	Nesse, W.D., 2004, Introduction to optical mineralogy : Oxford, 348p. Vernon, R.H., 2004, A practical guide to rock microstructure : Cambridge, 594p. Reed, S.J.B., 2005, Electron microprope analysis and scanning electron microscopy in geology : Cambridge, 189p. Zhou, W. and Wang, Z.L., 2007, Scanning microscopy for nanotechnology : Springer, 522p. Fultz, B. and Howe, J.M., 2002, Transmission electron microscopy and diffractometry of materials : Springer, 748p. Vanloon, J.C. and Barefoot, R.R., 1989, Analytical methods for geochemical exploration : Academic Press, 344p. Fifield, F.W. and Haines, P.J., 2000, Environmental Analytical chemistry : Blackwell Science, 490p. Jones, M.P., 1987, Applied mineralogy : Graham & Trotman, 259p. Nicol, A.W., 1975, Physicochemical methods of mineral analysis : Plenum Press, 508p.

Evaluation	attendance	report	mid	final	-	-	total
	10%	30%	30%	30%	%	%	100%
	remark						

notes	- lecture room : 38-128 - Lectures : Monday, Wednesday 2.5 - 1.5 (10:30-11:45 am) - laboratory : 38- 131 , 880-7236

	Week	Topics
Programs	1	Optical properties of minerals(1)
	2	Optical properties of minerals(1)
	3	Thin-section making and Observation using polarized microscope(1)
	4	Thin-section making and Observation using polarized microscope(1)
	5	Polished-section making and Observation using reflected microscope(1)
	6	Polished-section making and Observation using reflected microscope(2)
	7	Sample preparation and analysis(1); Midterm exam
	8	Sample preparation and analysis(2)
	9	Sample preparation of earth materials and X-ray using instrumental analysis techniques(1)
	10	Sample preparation of earth materials and X-ray using instrumental analysis techniques(2)
	11	Sample preparation of earth materials and X-ray using instrumental analysis techniques(3)
	12	Understanding and practice of Electron microscope(1)
	13	Understanding and practice of Electron microscope(2)
	14	Understanding and practice of EPMA method(1)
	15	Understanding and practice of EPMA method(2)