

Course Name	Advanced course on Antarctic science		
Semester, Year	Second Semester, 2018	Number of Credits	2 credits
Course level	5000	Course Number	27108
Instructor(s) (Institution)	Shin SUGIYAMA (低温科学研究所) Manabu FUKUI (低温科学研究所) Heinz Blatter (スイス連邦工科大学) Wilhelm Hagen (ブレーメン大学)		
Course Objectives	The goal of this lecture is to learn diverse processes in Antarctica and the cryosphere in English. Lecture topics include snow cover, sea ice, glacier, ice sheets and marine biology. The program also offers an opportunity to present a short talk on Antarctica in English.		
Course Goals	After the class participants should be able to: - understand physical processes occurring in Antarctica and cryosphere (e.g. snow cover, sea ice, glacier, ice sheet). - understand biological environment, processes and diversity in Antarctic and Arctic ocean. - state the most important current scientific topics in the field of cryosphere science. - learn in English and communicate with world's leading scientists. - present a short talk in English.		
Course Schedule	I. Snow, ice and climate in the cryosphere 1. Cryosphere and climate 2. Land ice and snow 3. Sea ice 4. Glaciers 5. Ice sheets 6. Past of the cryosphere 7. Future of the cryosphere II. Marine Biology 1. Polar marine biology I 2. Polar marine biology II 3. Plankton and Euphausia in the Southern Ocean 4. Mammalia in the polar oceans III. Presentation seminar Participants present a short oral talk in English on topics related to Antarctic science. The presentation is followed by discussion with other participants.		
Homework	Study the topic with the books in advance. Watch the film of the tele-teaching lectures. Questioning and communicating with the lecturers by e-mail is encouraged.		
Grading System	Score is given based on attitude (questions, discussion, active involvement) in the class (60%), written assignment (30%), and performance (presentation, question and answer, discussion) in the seminar.		
Textbooks / Reading List	教科書の指定はなし。講義スライドと専門用語対訳表を印刷したテキストを配布する。(No specific textbook is used in the class. Lecture slides and glossary will be provided in the class.) Biological Studies in Polar Oceans - Exploration of Life in Icy Waters G. and I. Hempel 編 Wissenschaftsverlag NW 2009 State of the Cryosphere: Glaciers and Ice Sheets Hamish Pritchard 編 American Geophysical Union 2009 Physics of Glaciers Kurt M. Cuffey and W. S. B. Paterson 2010 2010 なぞの宝庫・南極大陸 100 万年前の地球を読む 飯塚、杉山、澤柿、的場 技術評論社 2008		
Websites	http://www.earth.ees.hokudai.ac.jp/IAI/		
Website of Laboratory			
Additional Information	- Lecture schedule is announced on the IAI HP below (the course is organized as an intensive course in October and November). - This lecture is organized under the framework of IAI (Institute of Antarctic Science) and Curriculum of Antarctic Science of H		