

Training Course on 'Gas Hydrate Exploration & Development'

- Week 1 -

(Location : Ara Room)

| Date/Time | Program Description | Remarks |
|---|---|---|
| 11. 1 (Mon) 14:30-15:00 | Registration | Ara room |
| 11. 1 (Mon) 15:00-17:00 | Topic 1. Gas Hydrate R&D in KIGAM Gas Hydrate R&D in KIGAM | Ara room Dr. Byong-Jae Ryu (KIGAM) |
| 11. 2 (Tue) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 2 (Tue) 09:40-10:40 10:55-11:50 11:50-12:55 13:00-15:15 15:30-17:45 | Topic 2. Geophysical Aspects of Gas Hydrate #1 Lecture 1: Introduction Lecture 2: Gas hydrate exploration Lunch Lecture 3-4: Seismic indicators of gas hydrate and associated gas Lecture 5-6: Application of amplitude-variation-with-offset (AVO) technique to gas hydrate prediction | Ara room Prof. Gwang Lee (Pukyong National University) |
| 11. 3 (Wed) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 3 (Wed) 09:40-11:50 11:55-12:55 13:00-15:15 15:30-17:45 | Topic 2. Geophysical Aspects of Gas Hydrate #2 Lecture 1-2: Heat flow estimation from the depth of the bottom-simulating reflector Lunch Lecture 3-4: Case studies Lecture 4-5: Exercise | Ara room Prof. Gwang Lee (Pukyong National University) |
| 11. 4 (Thu) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 4 (Thu) 09:40-11:50 11:55-12:55 13:00-15:15 15:30-17:45 | Topic 3. Natural Gas Hydrates #1 - What is a Natural Gas Hydrate Lecture 1-2: What is a natural gas hydrate Lunch Lecture 3-4: Where natural gas hydrates occur Lecture 5-6: Geological, geochemical and geophysical techniques to locate natural gas hydrates | Ara room Dr. Alexei V. Milkov (British Petroleum) |
| 11. 5 (Fri) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 5 (Fri) 09:40-11:50 11:55-12:55 13:00-15:15 15:30-17:45 | Topic 3. Natural Gas Hydrates #2 - Examples of Natural Gas Hydrate Occurrences Lecture 1-2: Marine high gas flux environments (seeps, mud volcanoes): Haakon Mosby Mud Volcano, Gulf of Mexico, Hydrate Ridge Lunch Lecture 3-4: Marine low gas flux environments: Blake Ridge, Hydrate Ridge Lecture 5-6: Hydrated gas accumulations onshore: Russia, Alaska, Canada - Geochemistry of natural gas hydrates | Ara room Dr. Alexei V. Milkov (British Petroleum) |
| 11. 6 (Sat) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 6 (Sat) 09:40-11:50 11:55-12:55 13:00-17:45 | Topic 3. Natural Gas Hydrates #3 - How much Gas occurs in Natural Gas Hydrates Lecture 1-2: Accumulations and provinces Marine low gas flux environments: Blake Ridge, Hydrate Ridge Lunch Lecture 3-6: Worldwide - Economic geology of natural gas hydrates | Ara room Dr. Alexei V. Milkov (British Petroleum) |

※ The working language of this course is English

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- Week 2 -

(Location : Ara Room & R/V Tamhae-II)

| Date/Time | Program Description | Remarks |
|------------------------------------|--|--|
| 11. 7 (Sun) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 7 (Sun) 09:40-11:50 | Topic 4. Characterization of Hydrate-Bearing Sediments #1 Lecture 1-2: Geophysical and Geomechanical characterization of synthetic HBS: elastic wave velocities, mechanical behaviors, thermal and electrical properties | Ara room |
| 11:55-12:55 | Lunch | Prof. Tae Sup Yun (Yonsei University) |
| 13:00-17:45 | Lecture 3-6: Characterization of HBS recovered by pressure coring and scaled-production testing | |
| 11. 8 (Mon) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 8 (Mon) 09:40-11:50 | Topic 4. Characterization of Hydrate-Bearing Sediments #2 Lecture 1-2: Image analysis of HBS and geomaterials: X-ray and 3D micro-CT | Ara room |
| 11:50-12:55 | Lunch | Prof. Tae Sup Yun (Yonsei University) |
| 13:00-15:15 | Lecture 3-4: Sediment characterization and its implication | |
| 15:30-17:45 | Lecture 5-6: Relevant experimental and numerical methods applicable to HBS | |
| 11. 9 (Tue) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 9 (Tue) 09:40-11:50 | Topic 5. Laboratory Studies of Gas Hydrates Lecture 1-2: Geological and geochemical analyses - Overview on board and onshore experiments for characterization of gas hydrate occurrence | Ara room |
| 11:55-12:55 | Lunch | Dr. Jang-Jun Bahk (KIGAM) |
| 13:00-14:00 | Lecture 3: Geological and geochemical analyses - Demonstration of experiments with natural gas hydrate samples | |
| 14:15-15:15 | Experimental studies for development of gas hydrate production technologies Lecture 4: Overview on gas hydrate production technologies and related physical properties | Dr. Joo Yong Lee (KIGAM) |
| 15:30-16:30 | Lecture 5: Experimental studies on the physical properties of hydrate-bearing sediments | |
| 16:45-17:45 | Lecture 6: Experimental studies on the production behaviour of hydrate-bearing sediments | |
| 11. 10 (Wed) 08:30-09:30 | Korean Language & Culture Class | Mirinae room |
| 11. 10 (Wed) 10:00-15:00 | Topic 6. Gas Hydrate Survey using R/V Tamhae-II #1 Move to Janhae, R/V Tamhae-II | IS-Geo |
| 16:00-18:00 | Lecture: Gas hydrate indicators Overview on gas hydrate indicators for the presence of gas hydrate (geological, geochemical and geophysical indicators) | Dr. Byong-Jae Ryu (KIGAM) |
| 11. 11 (Thu) 09:00-10:00 | Topic 6. Gas Hydrate Survey using R/V Tamhae-II #2 Lecture 1: Overview on R/V Tamhae-2 | Tamhae-II |
| 10:00-11:00 | Lecture 2: Introduction and overview of equipments for marine gas hydrate survey | Dr. Byong-Jae Ryu (KIGAM) |
| 11:00-12:00 | Lecture 3: 2D/3D seismic system | Dr. Dong-Geun Yoo (KIGAM) |
| 11. 12 (Fri) | Departure | IS-Geo |

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