Course code	20DASb0301
Course title	Introduction to Instruments of Radio Astronomy
Term	後期 2nd Half
Credit(s)	2
The main day	
The main period	
School/Program	School of Physical Sciences
Department/Program	Department of Astronomical Science
Category	Radio Astronomy
Lecturers	

Instructor

Full name
ISHII SHUN
GONZALEZ, Alvaro

Outline

This course provides principles of optics, various detectors, and signal processing in radio observations. The course gives an introduction to radio telescope systems and observing methods.

Goal

- Explain the principles of optics in radio observations
- Explain the principles of detectors in radio observations
- Explain the principles of signal processing in radio observations
- Explain the principles of radio telescope systems
- Explain the basic methods and techniques for radio observations

Grading system

01:Four-grade evaluation (A,B,C,D)

Grading policy

Assessment will be done based on the final report for students with the attendance of more than 60%

Lecture Plan

1 Fundamentals of radio astronomy
2 Radio telescope systems
3 Antennas
4 Receiver optics

5 Cryogenics
6 Heterodyne receivers
7 Bolometer receivers
8 Backend: Digitizers, spectrometers and correlators
9 Microwave photonics
10 Single-dish observation
11 Interferometric observation
12 Calibration methods
13 Imaging techniques
14 Case studies or current technology vs. future trends
15 Tour of the development laboratory (tentative)

Location

Lecture Room in the NAOJ Mitaka Campus

Language

English or Japanese, Lecture materials will be written in English.

Textbooks and references

References
- シリーズ現代の天文学16 宇宙の観測II 電波天文学, 中井 直正, 坪井 昌人, 福井 康雄
- "Tools of Radio Astronomy", Thomas L. WilsonKristen Rohlfs and Susanne Hüttemeister
- "Interferometry and Synthesis in Radio Astronomy", A. Richard ThompsonJames M. MoranGeorge W. Swenson Jr.