

<<Last Updated:2022/02/17>>

## Course Schedule Information

Course Code	281524
Semester	Fall and Winter Term
Day and Period	Tue3
Course Name (Japanese)	Quantum metrology
Room	School of Engineering/A1-111
Course Name	Quantum metrology
Capacity	999
Course Numbering Code	28SEEE6J606
Credits	2.0
Student Year	1,2
Field	
Instructor	MURATA Isao,SATOU Fuminobu,TAMAKI Shingo
Course of Media Class	Not Applicable

※About Course of Media Class

"Course of Media Class" are classes in which more than half of the classes are held in places other than classrooms by making advanced use of various media.

Undergraduate students can include up to 60 credits in media class course as requirements for graduation.

Even if this is not the case, we may hold classes using the media.

## Basic Syllabus Information

Eligibility	Division of Sustainable Energy and Environmental Engineering
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## Detailed Syllabus Information

Language of the Course	Japanese/English
Type of Class	Lecture Subject
Course Objective	To learn basic characteristics of neutrons and so-called neutron science including neutronics and neutron physics.
Learning Goals	Students can understand neutron and interaction of it with matter, i.e., nuclear reaction, and even the theory. Also they can discuss the latest results of neutron nuclear reaction cross section measurements by leaning principle of neutron detection technique.
Requirement / Prerequisite	It would be preferable for students to learn basic theory of radiation measurement.
Class Plan	1st week Abstract 2nd week Discovery of neutron and neutron source 3rd week Neutron nuclear data 4th week Neutron cross section and nuclear data library 5th week Nuclear reaction theory (Principle and Statistical model) 6th week Nuclear reaction theory (Direct process, pre-equilibrium process) 7th week Scattering theory and nuclear data evaluation 8th week Neutron shielding (Principle) 9th week Neutron shielding (Application) 10th week Neutron measurement (Introduction) 11th week Neutron measurement (low energy and fast neutron) 12th week Neutron measurement (epi-thermal neutron) 13th week Neutron measurement (spectrum measurement) 14th week Neutron measurement (Bayes estimation method) 15th week Neutron measurement (Activation detector and counter telescope)

<b>Independent Study Outside of Class</b>	It is highly recommended to review the class because there is a deep relation among classes in this course. To estimate it, a small test may be carried out about the subject in the previous week.
<b>Textbooks</b>	Electronic files on the CLE and/or printed-out papers prepared by the instructor will be used.
<b>Reference</b>	Theoretical Nuclear Physics, Blatt, Weisskopf、中性子科学((社)日本原子力産業会議)
<b>Grading Policy</b>	By attendance to start estimation, then small practices (30%) and term-end examination(70%).
<b>Other Remarks</b>	Lecture is in English and Japanese.
<b>Special Note</b>	Nothing specially.
<b>Office Hour</b>	10 am to 5 pm from Mon. to Fri.
<b>Messages to Prospective Students</b>	This lecture is carried out face-to-face

## Instructor(s)

<b>Instructor Name</b>	<b>Name (hiragana)</b>	<b>Affiliation, Title, Course</b>	<b>Office</b>	<b>Extension</b>	<b>Fax</b>	<b>E-mail</b>
Isao MURATA			A15-113	7892		murata@see.eng.osaka-u.ac.jp
Fuminobu SATO			A14-112	3651		fsato@see.eng.osaka-u.ac.jp
TAMAKI Shingo			A15-125	7894		tamaki@see.eng.osaka-u.ac.jp

## Cautions for Students

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