Category （科目区分）	Cluster of Pathology and Pathology System		
Course Title （授業科目名）	Cell Ultrastructure and Experimental Practice		
Instructors （担当者名）	Akiteru Goto	Academic Year （配当年次）	1,2
Required Course / Elective Course （必修/選択）	Elective Course	Credits （単位数）	1
Class Format （授業形態）	Experimental practice		
Schedule （開講期間）	Oct. 2026 to Mar. 2027 (details of the schedule to be discussed)		
Class Date/Period （開講曜日・時間）	Every Friday from 18:00 to 21:30 (details of the schedule to be discussed)		

Course Outline/ Course Objectives（授業の概要・到達目標）

Course Objectives: The objectives of this course are to learn how to prepare specimens for electron microscopes (TEM, SEM), how to operate the equipment, and how to interpret the electron microscopic images.
Course Goals: The goals of this course are for the students to understand, reproduce, and explain the techniques of how to prepare specimens for electron microscopes (TEM, SEM), how to operate the equipment, and how to interpret the electron microscopic images (TEM, SEM).
Course Outline:
1, 2. The principles of electron microscopy will be explained.
3, 4, 5. Hands-on training in specimen preparation techniques such as resin embedding, sample sectioning and staining (for TEM), sample drying, and deposition (for SEM).
6, 7, 8. Observation and photography of electron microscope specimens.
9. Cell nuclei, intracellular filaments, mitochondria, and other structures will be covered, as well as methods for differentiating renal lesions, myocardial lesions, and tumors.

Course Planning（授業計画）

	Course Outline/ Course Objectives（授業の概要及び到達目標） （Contents of Class　　（（授業内容）））	Instructor （担当教員名）	Department （講座名） Class Room 〔実施場所〕
1	Principles of electron microscopy 1	Akiteru Goto	Department of Quantitative Pathology [Bioscience Education and Research Support Center, Electron Microscope Room]
2	Principles of electron microscopy 2		
3	Specimen preparation for electron microscopy 1		
4	Specimen preparation for electron microscopy 2		
5	Specimen preparation for electron microscopy 3		
6	Electron microscope specimen observation 1		
7	Electron microscope specimen observation 2		
8	Electron microscope specimen observation 3		
9	Description of structures and lesions observed by electron microscopy		
10	Summary		

Grading Criteria　（成績評価の基準と方法）

This course consists of 30 hours of practice in the lecture room (laboratory) and 15 hours of self-study, for a total of 45 hours. Evaluation is based on attendance and attitude during the classes, the results of oral examinations, and the content of submitted reports.

Contact Information（問い合わせ先(氏名，メールアドレス等)）

Name：Akiteru Goto　/ E-mail：　akigoto@med.akita-u.ac.jp

Comment　（その他特記事項）

Information on enrollment: If you are a working graduate student and cannot attend the practice due to work or other reasons, we will adjust the schedule.
Textbooks and reference materials: As necessary, materials will be distributed or references will be specified.
Content of study during self-study time: It is desirable to conduct preparatory study according to the course objectives and lecture contents.