Category （科目区分）	Cluster of Metabolism and Information Systems		
Course Title （授業科目名）	Experimental diabetology		
Instructors （担当者名）	Hironori Waki	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）	Students will be notified by email after completing the course registration.		
Class Date/Period （開講曜日・時間）	Students will be notified by email after completing the course registration.		

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

Aim:
To acquire research techniques for elucidating the pathophysiology of diabetes and its complications, as well as for developing effective treatments.

Goal:
To develop the skills necessary for conducting experiments, analyzing experimental data, preparing and publishing research articles in scientific journals, and obtaining a doctoral degree.

Outline:
1. Fundamentals of diabetology and ethical considerations in animal experiments
2. Cell culture techniques (adipocyte differentiation)
3. Analysis of cultured cells (lipid staining, mRNA expression)
4. Measurement of blood glucose levels in diabetic mice and drug treatment procedures
5. Handling and genotyping of genetically engineered mice
6. Blood pressure measurement in experimental mice
7. Analysis of biochemical parameters in blood samples from experimental mice
8. Dissection techniques for experimental mice
9. Extraction of messenger RNA (mRNA) from tissues and quantification using RT-qPCR
10. Protein extraction from tissues and analysis using Western blotting
11. Microscopic examination of tissues and immunohistochemistry techniques
12. Data analysis and interpretation of experimental results

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	Diabetology basics and ethics of animal experiments	Hiroki Fujita, assistant professor	Department of Metabolism and Endocrinology 〔laboratory〕
2	Cell culture (adipocyte differentiation)	Hironori Waki, professor	
3	Analysis of cultured cells (lipid staining, mRNA expression)	Hironori Waki, professor	
4	Measurement of glucose levels of diabetic mice and drug treatment	Hiroki Fujita, assistant professor	
5	Genetically engineered mice and their genotyping	Hiroki Fujita, assistant professor	
6	Measurement of blood pressure of experimental mice	Tsukasa Morii, lecturer	
7	Measurement of biochemical parameters in blood of experimental mice	Tsukasa Morii, lecturer	
8	Dissection of experimental mice	Hiroki Fujita, assistant professor	
9	Messenger RNA extraction from tissues and measurement of mRNA by RT-qPCR	Tsukasa Morii, lecturer	
10	Protein extraction from tissues and measurement of protein by Western blotting	Hiroki Fujita, assistant professor	

	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〕
11	Microscopic examination of tissues and Immunohistochemistry	Hiroki Fujita, assistant professor	Department of Metabolism and Endocrinology 〔laboratory〕
12	Analysis of experimental data	Hiroki Fujita, assistant professor	

Grading Criteria （成績評価の基準と方法）

1 credet is conposed of experimental practice (30 hours) + self study (15 hours) (total 45 hours).
Evaluation will be made based on attendance, oral test, paper test and report.

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

Name: Hironori Waki / E-mail: wakih@gipc.akita-u.ac.jp

Comment （その他特記事項）

Information about the course: If a graduate student who is a member of society can't attend the practice due to work, we will adjust the schedule.
Textbook/Reference Books: The Japan Diabetes Society (ed.) "Training Guidebook for Diabetes Specialists".
Out of Class Study/Message: Preparation and review in accordance with the archievement goal, topics, and contents of class are essential.