Academic Year 2016

The Graduate School of Medical Sciences
Kumamoto University
(Doctoral Course)

Syllabus

The Graduate School of Medical Sciences
Kumamoto University

URL: http://www.medphas.kumamoto-u.ac.jp/en/medgrad/index.html

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The objective and principle of the Graduate School of Medical Sciences, Kumamoto University

The objective and principle of the Graduate School of Medical Sciences, Kumamoto University is to educate students with knowledge demanded to medical doctors who are leading medical professionals with research oriented abilities and strong problem solving abilities, and bioscientists who are capable of carrying out their own research at a international level in the area of their expertise, respectively.

Doctoral Course Curriculum Policy for the Graduate School of Medical Sciences, Kumamoto University

Our curriculum focuses on developing knowledge and skills as described below, through research guidance that includes omnibus-style lectures, course work, and the collaboration of multiple teaching fields. We do this to produce world-class researchers and educators who will be active in medical and life science fields, clinicians with strongly driven research aspirations, and other research-focused medical professionals.

1. Sophisticated and interdisciplinary knowledge needed to solve multidisciplinary problems relating to advanced medical and life sciences
2. A solid ability to pursue advanced world-class research in medical and life science fields
3. Advanced medical knowledge and clinical techniques needed to promote advanced medical care and lead medical technology innovation inside and outside Japan

Aspects of the new curriculum

The education at graduate schools of medicine in Japan so far has aimed to foster educators and researchers through medical research. In recent years, however, the research environment has changed, and lifestyle-related diseases have become larger clinical concer in comparison with acute diseases. In addition, the post-genome research has also been shifting from basic science to disease-related research.
In order to meet these changes, we set a second objective and principle for the Graduate School of Medical Sciences, Kumamoto University in order to educate “research-oriented medical professionals”. In accordance with this idea, we have developed new educational programs which enable students to acquire interdisciplinary and extensive medical knowledge and cutting-edge clinical skills, while cultivating a research-oriented mindset.
At the same time, we have revised our existing curriculum significantly so that students can, through tutorials, acquire not only extensive medical knowledge but also advanced research skills.
We have also restructured our four-major system into a single major system (medical major). While the former four-major system segmented basic, clinical and social medicine, the new system includes the joint supervision of research among multiple fields. These reforms to the educational system and its programs are the most ambitious ones since the Graduate School of Medical Sciences, Kumamoto University, was established in 1955. We are confident that our new programs are highly innovative in accordance with the national standards.
With these reforms, we will satisfy the needs to foster research-oriented clinical doctors as well as educators and researchers at an international level. With the enthusiastic support of young medical students from across Japan, we are committed to becoming one of the best institutions of medicine, well-suited to the needs of the new era.

Contents

1. Notandum for course registration

1) **General Education Programs:** There are compulsory and elective subjects offered in our graduate course curriculum, as described on page 3. Please note that students must obtain 30 designated credits during the four years in this graduate school. Otherwise, their academic work shall not be deemed complete, even if their research and Thesis are completed. Students are requested to contact their academic supervisors for advice in order to decide which elective subjects to take. An application form attached (page 4〜10) should be submitted to the Student Affairs Section, (Kyoumu-Tanto) at this graduate school office by May 16 (Mon). However, an application form for the "Educational course for researchers on translational research for eradication of AIDS; Translational research course" and "Educational course for research frontiers on AIDS; Research frontiers course" should be submitted to the Student Affairs Section, (Kyoumu-Tanto) at this graduate school office by April 11 (Mon).Applicants who have been approved as long-term students are allowed to take courses that include lecture courses, seminars, practice, etc. These courses must be completed within the approved time frame, which should not exceed eight years. However, each lecture course must be completed within one year. Such applicants must notify the Student Affairs Section.

2) **SOSEKI Registration:** Students' academic achievement information is to be managed by SOSEKI (Kumamoto University School Affairs Information System). After submitting the above-mentioned application, students should register their compulsory subjects and elective subjects listed in their application via a web browser of SOSEKI by May 16 (Mon).

3) **Special Courses or Programs:** In addition to the basic curricula on page 3, the following courses are available: A course for Translational Researchers of AIDS Control, A course for Advanced Researchers of AIDS, A course for Researchers of Developmental Biology and Regenerative Medicine, and Experts of Clinical Metabolic Informatics, and HIGO course. Be sure to consult with your academic supervisors before choosing your courses. For students who are taking the AIDS course, the leading graduate education HIGO program, and the Shibasaburo program for under graduate medical students and junior resident, there are a number of supplementary materials that will guide you in this process; please ask the Student Affairs Section.

4) **The grade when you take lecture subjects** : Students are supposed to take lecture subjects in the 1st grade, but adult graduate students can take those subjects in the 2nd grade or after in the 2nd grade.

5) **How to take "Riron" subjects:** Lecture-style **"Riron"** classes will be held in 90-minute sessions as indicated on page 11 and **attendance will be taken**. Lectures of all subjects will be given from Monday, June 6, 2016 to Thursday, March 30, 2017. Lectures are held during the daytime and the nighttime and are scheduled as follows: the 1st period is 8:45~10:15, the 2nd period is 10:30~12:00, the 3rd period is 13:15~14:45, the 4th period is 15:00~16:30, the 5th period is 16:45~18:15, and the 6th period is 18:30~20:00. If there are any students who can't understand Japanese, the lectures will be given in English (or it may be a combination of English and Japanese). Different class dates and times will be arranged separately when the scheduled date falls on public holidays and soon.

For some of the lecture courses, **remote teaching such as e-learning** (page 12) will be given to students who work or live in remote locations. Please ask the course director for details.

Deadline of taking lectures by using an e-learning system will be informed by e-mail or a homepage of Graduate School of Medical Sciences. So, please be sure to check your e-mail.

In some cases, **classes may be changed to a seminar or event held on and off campus**. The details of these events will be announced to students who want to take the "Riron", no later than two weeks before they are to be held, through e-mail, bulletin boards, and the website for the Graduate School of Medical Sciences. Students are required to ask the Student Affairs Section, Graduate School of Medical Sciences or their professors in advance for more information, such as how to submit proof of attendance and how students will be evaluated.

6) **Lecture Room**: Lectures offered by several instructors (omnibus classes) will be given in the lecture room 2 on the 3rd floor of the Medical Education & Library Building. The location of the lecture room is shown on the campus map (p.223). Refer to it in advance or ask your academic advisor, if necessary.

7) **Lectures Series "Medical Experiment Course":**The elective subjects, "Medical Experiment Course" (page 51) requires students to attend more than 8 lectures a year for credit. Attednance will be taken in all of these courses. Please note that lectures are held from April 5 (Tue) to April 12 (Tue) (from 1st to 4th period).

8) D1 Medical and Life Science Seminar and D2 Learning from Experienced Doctors:
D1 “Medical and Life Science Seminar” (page 42) and D2 “Learning from Experienced Doctors” (page 43), require students to attend more than 15 lectures for credit before completion of their Thesis research. Write 2 essays based on 2 talks chosen from more than 15 lectures. Length of the essays should be 250-500 words. Attednance will be taken in all of these courses. Send each essay to the supervisor (inviter of the talker) of the talk within one month by E-mail (not by hard copy or any other digital media). The file of the essay should be included in the E-mail both in an attached file and in the text. A carbon copy E-mail should be also sent to the Student Affairs Section (iyg-igaku@jimu.kumamoto-u.ac.jp). D1 “Medical and Life Science Seminar” and D2 “Learning from Experienced Doctors” will be given in principle from 17:30 on Wednesdays of the month at the lecture room 2 on the 3rd floor of the Medical Education & Library Building. However, the date, time or place of these lectures may change due to the instructor’s and lecturer’s schedules. Please check the details beforehand with the seminar guide leaflet distributed to each Department you belong to.

9) D4 Translational Research (TR) Seminar: This course, offered from 2014, is the subject using the selected 5 seminars of "D2 Learning from Experienced Doctors Seminar" and the selected seminars of " HIGO Business Seminar Series."Write 1 essay based on 1 talk chosen from the seminar “D4: Translational Research Seminar”. Length of the essay should be 250-500 words. “D4: Translational Research Seminar” requires students to attend more than 8 lectures for credit before completion of their Thesis research. Send the essay to Medical Faculty Educational Affairs Planning Section within one month by E-mail (not by hard copy or any other digital media). The file of the essay should be included in the E-mail both in an attached file and in the text. (iyg-igaku@jimu.kumamoto-u.ac.jp). Attendance will be taken in every talk by signing your name at the entrance of the lecture room

10) Research Conducting Program “Practice (Jissen)” I, II & Clinical Research Conducting Program “Practice (Jissen)” III: Research conducting programs in compulsory and elective compulsory subjects described on page 3 should be selected with reference to the syllabus. These subjects are comprised of the Journal club, learning of experimental planning and technique, practical experiments for the PhD Thesis research including interpretation and criticism of the results obtained, acquiring skills of scientific presentation and discussion etc, as executed in the Departments, to which students are assigned. The clinical research conducting subjects are mainly conducted through clinical training.
If your Permanent Department* and Present Department* are different, you can choose “Practice(Jissen) I” from Permanent Department, and “Practice(Jissen) II” from Present Department.
For example if your Permanent Department is “Orthopaedic and Neuro-Musculoskeletal Surgery,” and your Present Department is “Molecular Genetics”, you can choose “Orthopaedic and Neuro-Musculoskeletal System “Jissen” I” and “Molecular Genetics“Jissen” II”.
*Permanent Department: A department which is registered on school.
*Present Department: A department where you are temporarily in. (Some students are temporarily transferred from a department in the field of Clinical Medicine to a department in the field of Basic Medicine because of some reasons such as research and experiment.)

11) Assessment of Academic Grades: Each course director in charge of a particular subject of the Lecture Series “Riron” is responsible for the assessment of academic grades for the corresponding “Riron” subject. If there is a disagreement between the director and instructors of the class in regards to their information and instructions, please be aware that information provided by the chief instructor prevails over that of any other instructors. Submit all assignments (e.g., paper summaries and reports) directly to your directors/instructors, not to clerical members at the graduate school office. Assignments may be submitted via e-mail; in this case, be sure to keep a transmission record.

12) Grade Appeals System: We have grade appeals system for all students. Please refer to the notification which will be posted (mid-Jan and mid- June) on the bulletin board for the detail.

13) E-mail address: Announcements of change of lectures, e-learning, seminar, economic support, and other information will be mainly informed by e-mail, a homepage of Graduate School of Medical Sciences and a bulletin board. Please be sure to send your e-mail address to Student Affairs Section (iyg-igaku@jimu.kumamoto-u.ac.jp) by e-mail with your name and student number by April 5(Tue). If you change your e-mail address, please let us know your new e-mail address as soon as possible.

2. Registration Application (See page 4)

＜To be submitted to Student Affairs Section **by May 16 (Mon)**＞

＜An application form for the "AIDS" course should be submitted to the Student Affairs Section **by April 11 (Mon).**＞

Choose the subjects you are to take from the list in section 3: "Lecture course/subject and credit", and fill out the application. Refer to the syllabus for the content of each subject. "Field Name" means the fields of education provided in Practice (Jissen) I. Be sure to consult your academic supervisor before deciding on your subjects.

3. Lecture course/subject and credit

1) Curriculum outline

Subjects	Credits	Subjects	Credits
Compulsory subject		**Elective Subject**	
1.Lecture		(Chose 8 credits from below)	
A1 Medical Informatics & Medical Ethics (p.22)	2	B1 Pathophysiology and structural biochemistry of biomolecules (p.23)	2
2.Research Conducting Program		B2 Cell Biology (p.24)	2
Departmental Course "Practice (Jissen)" I (p.55～)	10	B3 Hematopoietic & Immune Systems (p.25)	2
		B4 Infection & Immune Control (p.26)	2
Elective compulsory subject I		B5 Human Brain Functional Science (p.27)	2
(Choose one from below)		B6 Neuroscience (p.28)	2
Course work		B7 Developmental & Regenerative Medicine (p.29)	2
1. Medical experiment course (p.51)	2	B8 Environmental & Sociomedical Sciences (p.30)	2
		C1 Current Theory of Medical Diagnosis (p.31)	2
2. Practicum on multidisciplinary cancer therapeutics, palliative care ※Note	2	C2 Advanced Therapeutics (p.32)	2
		C3 Metabolic & Circulatory Regulations (p.33)	2
Elective compulsory subject Ⅱ		C4 Reproductive & Developmental Medicine (p.35)	2
(Choose one from below)		C5 Advances in Oncologic Medicine I (p.36)	2
Research Conducting subject		C6 The Forefront of Clinical Oncology (p.37)	2
1.Departmental Course "Practice (Jissen)" Ⅱ (p.55～)	8	C7 Restorative Medicine (p.38)	2
		C8 Cancer Therapeutics (p.39)	2
Clinical conducting subject		C9 Paliative Care (p.40)	2
2. Departmental Course "Practice (Jissen)"Ⅲ (p.199～)	8	C10 The Theory of Clinical Research (p.41)	2
		D1 Medical and Life Science Seminar (p.42)	2
		D2 Learning from Experienced Doctors Seminar (p.43)	2
		D3 Medicine and Life Science Training (p.45)	2
		D4 Translational Research Seminar (p.48)	1

※D3"Medicine and Life Science Training" : A student's oral or poster presentation as a lead presenter at an academic conference is admitted as the credits. Please check page 45.

※Classes may be changed to a seminar or event held on and off campus. If you take these classes, please submit the certificate of attendance which you write your information when you attend the seminar.
The certificate of attendance will be given by Student Affairs Section or academic supervisor who organizes the seminar.

※Those who can take the "Practicum on multidisciplinary cancer therapeutics, palliative care" are limited to students who have the licenses of Doctor, Dentist, Nurse, Radiation technologist, Clinical laboratory technologist and Clinical engineering technologists.

※ It is possible to take the courses of "Graduate General Education Courses." You can include 2 credits as upper limit in the completion requirement (elective) "Graduate General Education Courses" please look at the syllabus on Moodle (e-Learning System) system.

2) Requirements

Compulsory subject	12 credits	
Elective compulsory subject I	2 credits	
Elective compulsory subject II	8 credits	
Elective subject	8 credits	or more
Total	30 credits	or more

Note: A maximum of 12 credits can be transferred from a master's degree at the Graduate School of Medical Sciences at Kumamoto University. Regarding the students who would like to transfer the credits, please offer to the Student Affairs Section by April 8 (Fri).

Fill out the application on the next page and submit it to the Student Affairs Section. It should be also input to SOSEKI (Kumamoto University School Affairs Information System) by May 16 (Mon).
(The students who take the "AIDS" course must input to SOSEKI by April 11 (Mon).)

4. How to make a registration application

(Doctoral course) Registration Application

( ) year/month/day

Dean, The Graduate School of Medical Sciences

Year entered :
Name :
Student number :
E-mail address :

Here, I would like to register for the following subjects.

Department		Supervisor	stamp
Course			

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
"Jissen" I	10	1st-4th grade		
Medical Informatics and Medical Ethics	2	1st-4th grade		
Total	12			

【Elective Compulsory subject I 】Course work subject

Subjects	Credit	Opening	Instructor	Other
	2	1st-4th grade		
Total	2			

【Elective Compulsory subjects II 】Instructive subject

Subjects	Credit	Opening	Instructor	Other
	8	1st-4th grade		
Total	8			

【Elective subjects】More than 8 unit

Subjects	Credit	Opening	Instructor	Other
	2	1st-4th grade		
	2	1st-4th grade		
	2	1st-4th grade		
	2	1st-4th grade		
Total				

Need to take 30 or more credits from the subjects opened in your school years.

(Doctoral course) Registration Application

[A model of taking classes in medical basic science]

( ) year/month/day

Dean, The Graduate School of Medical Sciences

Year entered :
Name :
Student number :
E-mail address :

Here, I would like to register for the following subjects.

Department	Immunogenetics	Supervisor	Yasuharu Nishimura stamp
Course	None		

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
Immunogenetics "Jissen" I	10	1-4 grade	Yasuharu Nishimura	Choose from their own field
Medical Informatics and Medical Ethics	2	1-4 grade*	Koichiro Usuku	
Total	12			

【Elective Compulsory subject I 】Course work subject

Subjects	Credit	Opening	Instructor	Other
Medical Experiment Course	2	1-4 grade*		
Total	2			

【Elective Compulsory subjects II 】Instructive subjects

Subjects	Credit	Opening	Instructor	Other
Immunogenetics "Jissen II"	8	1-4 grade	Yasuharu Nishimura	Choose from their own field
Total	8			

【Elective subjects】More than 8 unit

Subjects	Credit	Opening	Instructor	Other
B2: Cell Biology	2	1-4 grade*	Kazuhito Tomizawa	Choose from elective subjects
B4: Infection and Immune Control	2	1-4 grade*	Syuzo Matsushita	Choose from elective subjects
D1: Medicine and Life Science Seminar	2	1-4 grade*		Choose from elective subjects
D3 Medicine and Life Science Training	2	1-4 grade*		Choose from elective subjects
Total	8			

Need to take 30 or more credits from the subjects opened in your school years.

*Taking these courses in the first year is recommended. However, students can take these in their second, third, or forth academic year. Students are required to write down their academic year in which they plan to take them.

(Doctoral course) Registration Application

[A model of taking classes in clinical medicine]

( ) year/month/day

Dean, The Graduate School of Medical Sciences

Year entered :
Name :
Student number :
E-mail address :

Here, I would like to register for the following subjects.

Department	Orthopaedic	Supervisor	Hiroshi Mizuta stamp
Course	None		

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
Orthopaedic "Jissen" I	10	1-4 grade	Hiroshi Mizuta	Choose from their own field
Medical Informatics and Medical Ethics	2	1-4 grade*	Koichiro Usuku	
Total	12			

【Elective Compulsory subject I 】Course work subject

Subjects	Credit	Opening	Instructor	Other
Medical Experiment Course	2	1-4 grade*		
Total	2			

【Elective Compulsory subjects II 】Mentoring Subject

Subjects	Credit	Opening	Instructor	Other
Orthopaedic "Jissen" II Note:2)	8	1-4 grade	Hiroshi Mizuta	Choose from their own field Note:2)
Total	8			

【Elective subjects】More than 8 credit

Subjects	Credit	Opening	Instructor	Other
C7: Restorative Medicine	2	1-4 grade*	Hironobu IHN	Choose from elective subjects
C8: Cancer therapeutics	2	1-4 grade*	Hideo Baba	Choose from elective subjects
C10 The Theory of Clinical Research	2	1-4 grade*	Hiroaki Iwase	Choose from elective subjects
D2 Learning from Experienced Doctors	2	1-4 grade*		Choose from elective subjects
Total	8			

Notes

1) Need to take 30 or more credits from the subjects available during your school years.

* Taking these courses in the first year is recommended. However, students can take these in their second, third, or forth academic year. Students are required to write down their academic year in which they plan to take them.

2) If your Permanent Department and Present Department are different, you can choose "Practice(Jissen) I" from Permanent Department, and "Practice(Jissen) II" from Present Department.

（Doctoral course）Registration Application

[A model of taking classes in The Program for Experts of Metabolism, Circulation and Related Informatics]

（　　）year/month/day

Dean, The Graduate School of Medical Sciences

Year entered：
Name：
Student number：
E-mail address：

Here, I would like to register for the following subjects.

Department	Endocrinology and Metabolism	Supervisor	Eiichi　Araki　　stamp
Course	Endocrinology and Metabolism Course		

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
Endocrinology and Metabolism “Jissen” I	10	1-4 grade	Eiichi Araki	Choose from their own field
Medical Informatics and Medical Ethics	2	1-4 grade*	Koichiro Usuku	
Total	12			

【Elective Compulsory subject I 】Course work subject

Subjects	Credit	Opening	Instructor	Other
Medical Experiment Course	2	1-4 grade*		
Total	2			

【Elective Compulsory subjects II 】Instructive subjects

Subjects	Credit	Opening	Instructor	Other
Clinical metabolic informatics “Jissen” III Note:2)	8	1-4 grade	Eiichi Araki	Choose from their own field Note:2)
Total	8			

【Elective subjects】More than 8 credit

Subjects	Credit	Opening	Instructor	Other
B1: Pathophysiology and structural biochemistry of biomolecules	2	1-4 grade*	Shokei Kim-Mitsuyama	Be sure to select B1 or C3 in this course
C3: Metabolic and Circulatory Regulations	2	1-4 grade*	Eiichi Araki	Be sure to select B1 or C3 in this course
D2: Learning from Experienced Doctors	2	1-4 grade*		Choose from elective subjects
D3: Medicine and Life Science Training	2	1-4 grade*		Choose from elective subjects
Total	8			

Notes

1） Need to take 30 or more credits from the subjects available during your school years.

* Taking these courses in the first year is recommended. However, students can take these in their second, third, or forth academic year. Students are required to write down their academic year in which they plan to take them.

2) Choose one from Metabolomics Jissen II, Metabolic information epidemiology “Jissen” II, and Clinical metabolic informatics Jissen III

[How to take credits in The Course of Developmental Biology and Regenerative Medicine]

1. Special lectues and practice opened for "The Course of Developmental Biology and Regenerative Medicine"

Table 1: The Course of Developmental Biology and Regenerative Medicine (All lectures are given in English)

Subjects	Credit	Opening	Contents
Special lectures "Tokuron" on Developmental Biology and Regenerative Medicine I	2	1	Lectures on fundamental sciences underlying basis of regenerative medicine such as developmental biology and stem cell biology
Developmental Biology and Regenerative Medicine II	2	1-3	Lectures on applied biomedical sciences such as transplantation and reconstructive surgery
Transplantation Immunology	2	1	Lectures on basic and clinical immunology for medical transplantation
Bioethics	2	1-3	Lectures on bioethics, medical ethics and research ethics
Practices "Enshuu" on Developmental Biology and Regenerative Medicine I	2	2-3	Project-based learning aimed at enhancement of the ability on approaching solution of problems in regenerative medicine
Developmental Biology and Regenerative Medicine II	2	1-4	Lectures from researchers committed to cutting-edge research in the field of developmental and regenerative medicine
Developmental Biology and Regenerative Medicine III	2	1-4	Presentation of students' own research achievements in domestic and/or international conferences
Practical Training "Jisshuu" on Developmental Biology and Regenerative Medicine	2	1	Training of practical procedures for important experimental methods related to developmental and regenerative medicine

2. Planning of taking classes.

Table 1: The Course of Developmental Biology and Regenerative Medicine.

(Use a form in Page 9 for registration.)

Category	Subjects		Credit
Compulsory	Lecture	Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I	2
		Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine II	2
		Special Lecture "Tokuron" on Transplantation Immunology	2
		Special Lecture "Tokuron" on Bioethics	2
	Research	Jissen I(*1)	10
Elective	Lecture	Lecture courses and subjects in page 4	Need to take 12 or more credits (*2)
	Practice	D1 Medicine and Life Science Seminar	
		Practice "Enshuu" on Developmental Biology and Regenerative MedicineI	
		Practice "Enshuu" on Developmental Biology and Regenerative MedicineII	
		Practice "Enshuu" on Developmental Biology and Regenerative MedicineIII	
	Laboratory practice	Practical Training "Jisshuu" on Developmental Biology and Regenerative Medicine	
	Research	Jissen II (*1)	8
Need to take 30 or more credits.			

*1 In the Course of Developmental Biology and Regenerative Medicine, there are no Practice (Jissen) I and II specific to the course as research conducting programs to assist in a student's Thesis research. Thus, the students are allowed to take the course in any area, and they can take any 'Practice (Jissen) II' to enrich a graduate student's research path. However, this subject 'Practice (Jissen) II' should not be counted in the 30 credits required for graduation.

*2 Select more than 6 subjects (12 credits) in total, from Practice "Enshuu" on Developmental Biology and Regenerative Medicine II and III, Practical Training "Jisshuu" on Developmental Biology and Regenerative Medicine, lecture courses of 'Riron' which are open to all the students, and Medicine and Life Science Seminar.

(Doctoral course) Registration Application

[The Course of Developmental Biology and Regenerative Medicine]

( ) year/month/day

Dean, The Graduate School of Medical Sciences

Year entered :
Name :
Student number :
E-mail address :

Here, I would like to register for the following subjects.

Department		Supervisor	stamp
Course	The Course of Developmental Biology and Regenerative Medicine		

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I	2	1 grade	Minetaro Ogawa	
Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine II	2	1-3 grade	Hitoshi Niwa	
Special Lecture "Tokuron" on Transplantation Immunology	2	1 grade	Yasuharu Nishimura	
Special Lecture "Tokuron" on Bioethics	2	1-3 grade	Yasuhiro Kadooka	
"Jissen" I	10	1-4 grade		
Total	18			

【Elective Compulsory subjects】(12 credits or more)

Subjects	Credit	Opening	Instructor	Other
	2			
	2			
	2			
	2			
	2			
	2			
Total				

【Elective subjects】Mentoring Subject

Subjects	Credit	Opening	Instructor	Other
"Jissen" II	8	1-4 grade		
Total	8			

Note:

1) Need to take 30 or more credits from the subjects opened in your school years. Credit of JissenII will not be included in the above credits.

(Doctoral course) Registration Application

[A Model of taking classes in The Course of Developmental Biology and Regenerative Medicine]

( ) year/month/day

Dean, The Graduate School of Medical Sciences

Year entered :
Name :
Student number :
E-mail address :

Here, I would like to register for the following subjects.

Department	Cell Differentiation	Supervisor	Minetaro Ogawa stamp
Course	The Course of Developmental Biology and Regenerative Medicine		

【Compulsory subjects】

Subjects	Credit	Opening	Instructor	Other
Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I	2	1 grade	Minetaro Ogawa	
Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine II	2	1-3 grade ＊1	Hitoshi Niwa	
Special Lecture "Tokuron" on Transplantation Immunology	2	1 grade	Yasuharu Nishimura	
Special Lecture "Tokuron" on Bioethics	2	1-3 grade ＊1	Yasuhiro Kadooka	
Cell Differentiation “Jissen” I	10	1-4 grade	Minetaro Ogawa	Choose from your own field
Total	18			

【Elective Compulsory subjects】(12 credits or more)

Subjects	Credit	Opening	Instructor	Other
Practice "Enshuu" on Developmental Biology and Regenerative Medicine I	2	2-3 grade＊2	Minetaro Ogawa	Choose from elective subjects
Practice "Enshuu" on Developmental Biology and Regenerative Medicine II	2	1-4 grade＊2	Minetaro Ogawa	Choose from elective subjects
Practice "Enshuu" on Developmental Biology and Regenerative Medicine III	2	1-4 grade＊2	Minetaro Ogawa	Choose from elective subjects
Practical Training “Jisshuu" on Developmental Biology and Regenerative Medicine	2	1 grade	Minetaro Ogawa	Choose from elective subjects
B7 : Developmental and Regenerative Medicine	2	1-4 grade＊2	Ryuichi Nishinakamura	Choose from elective subjects
D1: Medicine and Life Science Seminar	2	1-4 grade＊2		Choose from elective subjects
Total	12			

【Elective subjects】Mentoring Subject

Subjects	Credit	Opening	Instructor	Other
Cell Differentiation “Jissen” II	8	1-4 grade	Minetaro Ogawa	＊3
Total	8			

Note: Need to take 30 or more credits from the subjects opened in your school years. Credit of JissenII will not be included in the above credits.

*1 These subjects require more than one year to be completed, thus cannot be completed in one year. Students taking these subjects must register carefully. The registration process is different from the items on *2.

*2 Taking these subjects in the early academic years is recommended. However, students can take them at any time during their academic path. (Students are allowed to take ‘Practice (Enshuu)’ or ‘Seminar’ subjects for more than one year in order to earn credits by attending a certain number of lectures.) Students are required to write down the academic year in which they plan to take them. (Note: As for the subjects of ‘Practice (Enshuu)’ and ‘Seminar’, please write ‘1~4’ in each “Academic year” column.)

*3 For students who have completed the master’s course at the Graduate School of Medical Sciences at Kumamoto University, the total 8 credits for Medical Science Training and Medical Science Practicum will be transferred.

5. Doctoral course
Lecture course timetable

	Week	1	2
		4/4 ～ 4/8	4/11 ～ 4/15
Mon.	1 2 3 4	Medical Experiment Course	Medical Experiment Course
Tue.	1 2 3 4	Medical Experiment Course	Medical Experiment Course
Wed.	1 2 3 4	Medical Experiment Course	
Thu.	1 2 3 4	Medical Experiment Course	Health examination
Fri.	1 2 3 4	Medical Experiment Course	

2016 First semester

	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		6/6 ～ 6/10	6/13 ～ 6/17	6/20 ～ 6/24	6/27 ～ 7/1	7/4 ～ 7/8	7/11 ～ 7/15	7/18 ～ 7/22	7/25 ～ 7/29	8/1 ～ 8/5	8/8 ～ 8/12	8/15 ～ 8/19	8/22 ～ 8/26	8/29 ～ 9/2	9/5 ～ 9/9	9/12 ～ 9/16	9/19 ～ 9/23	9/26 ～ 9/30	10/3 ～ 10/7
Mon.	4			A1 Medical Informatics and Medical Ethics				※Holiday	A1 Medical Informatics and Medical Ethics				A1 Medical Informatics and Medical Ethics				※Holiday	A1	
	5	A1		B4 Infection and Immune Control					B4 Infection and Immune Control				B4 Infection and Immune Control					B4	
	6	B4																	
Tue.	4			B1 Pathophysiology and structural biochemistry of biomolecules									B1 Pathophysiology and structural biochemistry of biomolecules						
	5	B1		B5 Human brain functional Science									B5 Human brain functional Science						
	6	B5																	
Wed.	4	B6 Neuroscience											B6 Neuroscience						
	5	Seminar hour											Seminar hour						
	6																		
Thu.	4			B2 Cell Biology							※Holiday		B2 Cell Biology				※Holiday	B2	
	5	B2		B7 Developmental and Regenerative Medicine									B7 Developmental and Regenerative Medicine					B7	
	6	B7																	
Fri.	4			B3 Hematopoietic and Immune Systems									B3 Hematopoietic and Immune Systems						
	5	B3		B8 Environmental and Sociomedical Sciences									B8 Environmental and Sociomedical Sciences						
	6	B8																	

2016 Second semester

	Week	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
		10/10 ～ 10/14	10/17 ～ 10/21	10/24 ～ 10/28	10/31 ～ 11/4	11/7 ～ 11/11	11/14 ～ 11/18	11/21 ～ 11/25	11/28 ～ 12/2	12/5 ～ 12/9	12/12 ～ 12/16	12/19 ～ 12/23	12/26 ～ 12/30	1/2 ～ 1/6	1/9 ～ 1/13	1/16 ～ 1/20	1/23 ～ 1/27	1/30 ～ 2/3	2/6 ～ 2/10	2/13 ～ 2/17	2/20 ～ 2/24	2/27 ～ 3/3	3/6 ～ 3/10	3/13 ～ 3/17	3/20 ～ 3/24	3/27 ～ 3/31
Mon.	4	※Holiday	E3 Transplantation immunology (1st grade)												※Holiday	E3 Transplantation immunology (1st grade)			E2 Developmental Biology and Regenerative Medicine II(1st grade and					※Holiday		E2 (1,2)
	5		C10 The Theory of Clinical Research													C10			C8 Cancer therapeutics							C8
	6																	C10								
Tue.	4		C5 Advances in Oncologic Medicine I												C5 Advances in Oncologic Medicine I				C1 Current Theory of Medical Diagnosis							
	5		C6 The Forefront of Clinical Oncology II												C6 The Forefront of Clinical Oncology II				C2 Advanced therapeutics							
	6																									
Wed.	4		C7 Restorative Medicine					※Holiday	C7 Restorative Medicine						C7 Restorative Medicine											
	5		Seminar hour						Seminar hour						Seminar hour				Seminar hour							
	6																									
Thu.	4		E1 Developmental Biology and Regenerative Medicine I(1st grade)		※Holiday	E1 Developmental Biology and Regenerative Medicine I(1st grade)									E1 Developmental Biology and Regenerative Medicine I(1st grade)				E2Developmental Biology and Regenerative Medicine II(3rd)							
	5		C4 Reproductive and Developmental Medicine			C4 Reproductive and Developmental Medicine									C4 Reproductive and Developmental Medicine				C8 Cancer therapeutics							
	6																									
Fri.	4																		C1 Current Theory of Medical Diagnosis							
	5		C3 Metabolic and Circulatory Regulations									※Holiday			C3 Metabolic and Circulatory Regulations				C2 Advanced therapeutics							
	6																			C8						

1st priod 8:45～10:15
2nd priod 10:30～12:00
3rd priod 13:15～14:45
4th priod 15:00～16:30
5th priod 16:45～18:15
6th priod 18:30～20:00

A1 : Compulsory subjects
B1～B8、C1～C10 : Elective subjects
E1～E4 : The Course of Developmental Biology and Regenerative Medicine

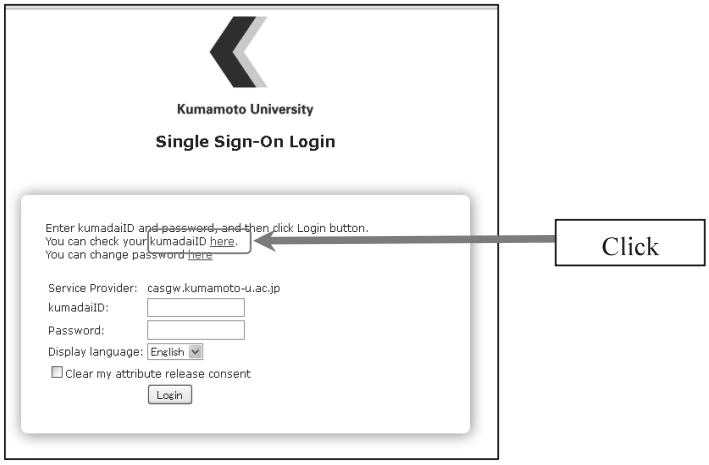
Lecture Room: Lectures offered by several instructors (omnibus classes) will be given in the lecture room 2 on the 3rd floor of the Medical Education & Library Building.

※For students who are taking the AIDS course, there are a number of supplementary materials that will guide you in this process; please ask the Student Affairs Section, Graduate School of Medical Sciences for further information.

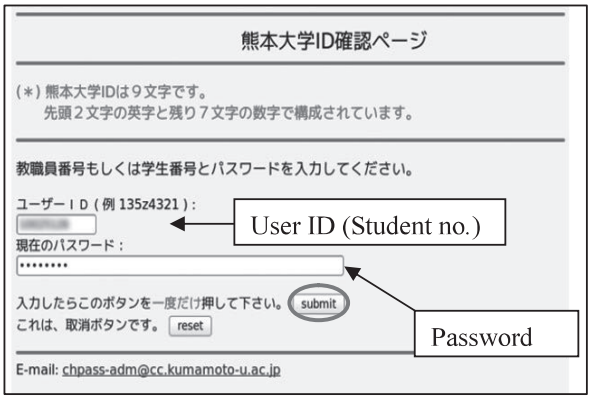
6. How to participate in lectures through e-learning

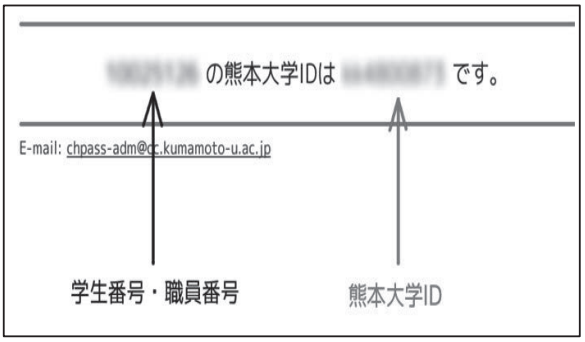
1) How to access the e-learning system（Moodle）

1.Access Kumamoto University's Portal website (http://uportal.kumamoto-u.ac.jp/), and log on to Kumamoto University Portal's Site by entering your Kumadai ID and password. Your Student number and password are written on the back of your Student ID.



2.You can check your "kumadai UD" entering your Student number and password, and then click the "submit".

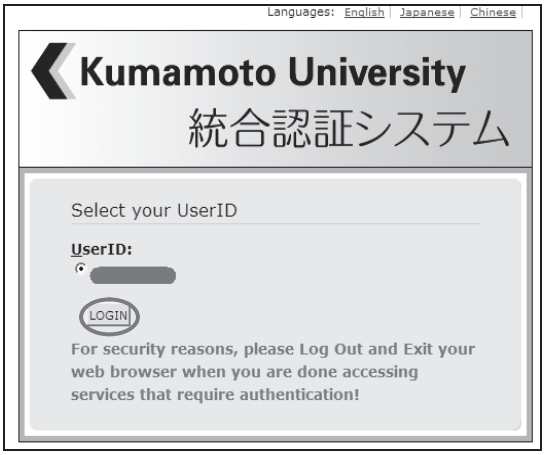




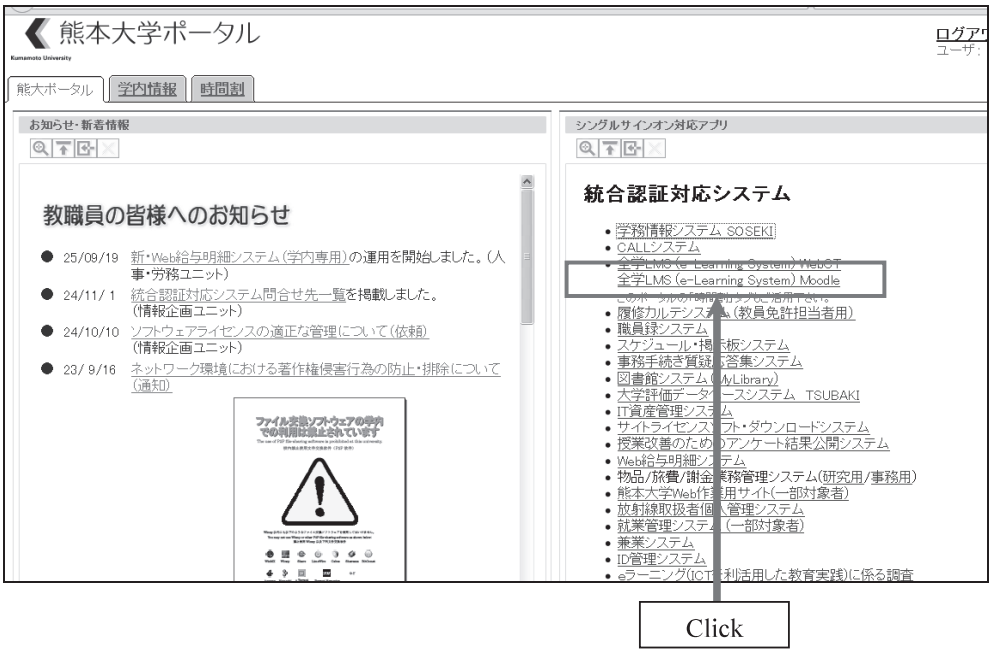
Student no. kumadai ID

Your User ID and password are written on the back of your Student ID.

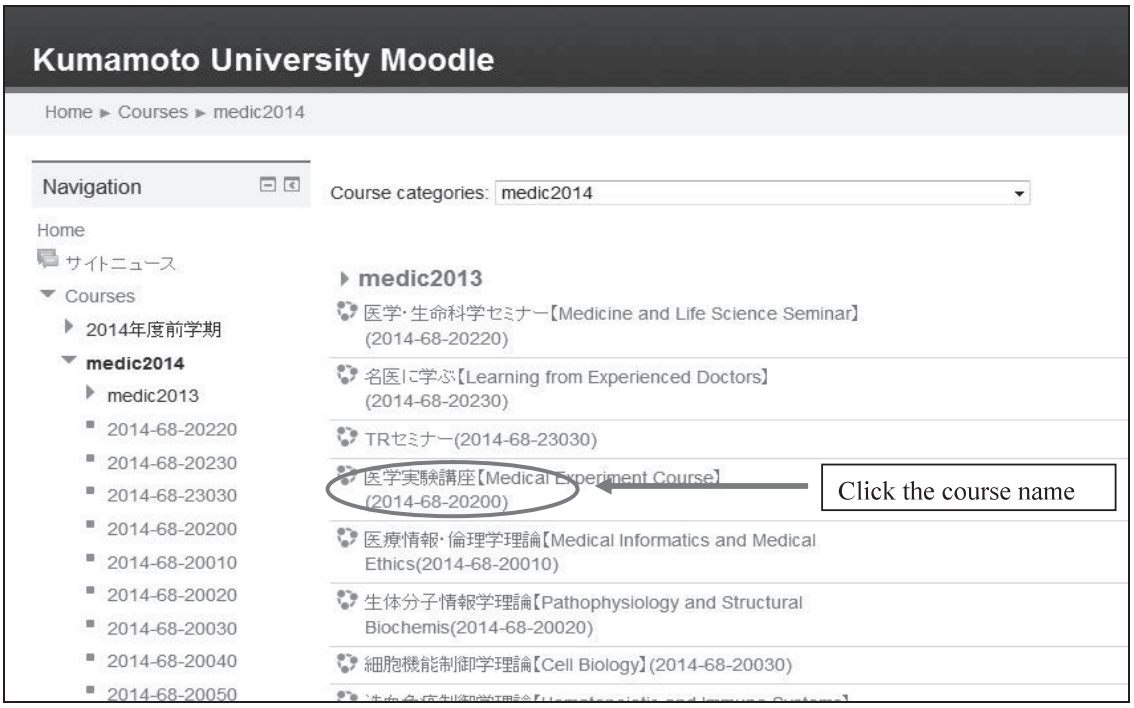
3.Check student number , and then click the "LOGIN". Your Student number is written on the back of your Student



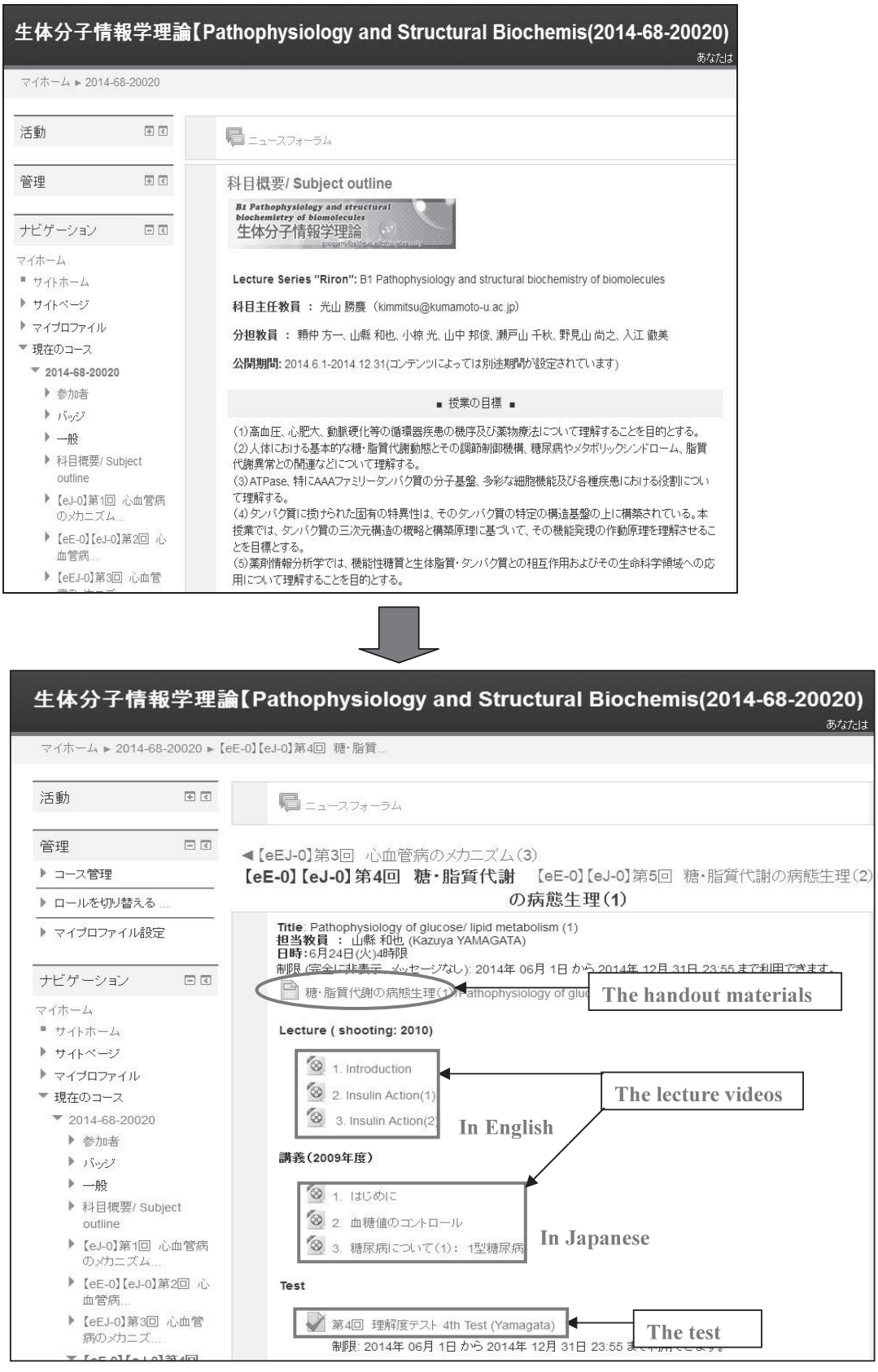
4. If you successfully log in the system, please click the ”全学 LMS(e-Learning System)Moodle”.



5. Home shows the list of courses you have registered for through SOSEKI. By clicking the course name, you may access to the top page, which displays the list of lectures held in the course. When you click on the “How to change your language”, you can change the language into English.



6. From each lecture page, you are able to learn the contents through the lecture videos and handout materials; and then, take tests to determine your understanding. If you pass the tests, your lecture participation would be completed. After taking tests, you may confirm and study again the part of insufficient understanding and take test up to a ceiling of twice.



※Notice) Regarding the students who would like to take“D1 Medicine and Life science Seminar” and “D2 Learning from Experienced Doctors”by using the e-learning system, please check the procedure for taking these subjects in the e-learning contents of ”D1 Medicine and Life science Seminar” and “D2 Learning from Experienced Doctors”.

2) Classification of e-learning

Please note that the lectures by e-learning are classified into 6 types: eE-O, eE-L, eJ-O, eJ-L, eEJ-O and eEJ-L. These marks are written in the pages of the lecture schedule of each subject.

1. Classified according to the language used in the lecture.
   eE: e-learning content in English
   eJ: e-learning content in Japanese
   eEJ: e-learning content in both Japanese and English

2. Classification according to the use of e-learning for the lecture.
   -O: Lecture only by e-learning; no face-to-face class will be conducted.
   -L: In principle, a face-to-face lecture; if unable to attend the lecture, a student may participate in the lecture through e-learning as supplementary lecture.

3. Regarding a lecture with e-learning content prepared only in Japanese (eJ-O or eJ-L), if an international student, who cannot understand Japanese, has registered for such lecture, the face-to-face lecture will be conducted in English (+ Japanese). This lecture may be recorded to be used for an e-learning content as eE or eEJ in future.

4. Example of e-learning classification:
   eJ-L means “students are requested to attend the face-to-face lecture in principle, but if unable to do so, they can participate in the e-learning lecture prepared in Japanese language as supplementary lecture”. If an international student, who cannot understand Japanese, has registered for the course, a face-to-face lecture will be conducted in English (+Japanese).

＊We are modifying the criterion of a thesis and early completion system for academic year of 2016. We will notify the final decision as soon as possible.

7. Screening criterion of a thesis and assessment criterion for the final examination

【Doctoral Course】

The application for academic degree entails thesis submission and at least one relevant paper as described below,. For an applicant who has obtained designated school credits and has submitted a thesis, a thesis screening and final examination will be given.

Screening criterion of a thesis

1) The thesis should sufficiently dissert the research background, including the documented facts, which serve as a background of the research. The objectives and fundamental strategy of the research, detailed experimental methodology, result of experiments and its interpretation, should also be included. In addition, an in-depth discussion including bibliographic consideration, and the colligation concerning the significance of the research should be included as well. A copy or translation of a previous paper will not be accepted.
2) The thesis should be prepared in accordance with the required documentation methodology.

Criterion for approving relevant papers

1) Relevant papers should be written in a English and appear in one of the "Journals written in English for academic degree application" designated by the Graduate School of Medical Sciences.
2) Relevant papers should be related to the thesis research.
3) The applicant for an academic degree must be the first author of the relevant paper. When the paper is a joint work between the applicant and another researcher on an equal contribution basis, it must be clearly stated that both of them are regarded as the first co-authors (with equal contribution). However, except in the case of the next section,only one first co-author can use the paper for academic degree credit.
4) The relevant paper includes the paper in format of 'Short communication'.
5) The relevant papers should state 'Kumamoto University' as the degree applicants' home university.
6) Co-authors of the relevant papers, including researchers from the Graduate School of Medical Sciences, should be included in the acknowledgement.
7) The degree applicants who choose a thesis such as short communication must submit a pre-publication paper in advance to Student Affairs Section, Graduate School of Medical Sciences. The contents of the paper should be preliminary reviewed and approved by the Graduate School's Education Board.

Criterion for registration of "Journals written in English for academic degree application"

1) For foreign academic journals written in English, they should have a peer-review system and release the names of the editorial board members.
2) For domestic journals written in English, they should stipulate submission written in English, have a peer-review system and release the names of the editorial board members.
3) Online-format journals are acceptable so long as the conditions mentioned above are satisfied.

Assessment criterion for the final examination

The final exam is an oral examination (public presentation) and an assessment is made by the following criterion:

1) The examinee fully comprehends the content of his/her research and is able to explain it in detail.
2) The examinee is able to logically analyze the issues raised in his/her research.
3) The examinee is able to dissert the future prospect of his/her research.
4) The examinee has advanced knowledge in the field of his/her research.
5) The examinee has basic knowledge about fields related to his/her research

Early Completion System

Students who have completed all of their credit requirements and finished their Thesis ahead of time can obtain their doctoral degree if they are approved at the "Doctoral Degree Committee in the Early Completion System".

The period that students can complete the Graduate School of Medical Sciences by Early Completion System is as follows.

1) March of the 3rd grade (In the case of the students enrolled in October, September of the 3rd grade)
2) June of the 4th grade (In the case of the students enrolled in October, December of the 4th grade)
3) September of the 4th grade (In the case of the students enrolled in October, March of the 4th grade)
4) December of the 4th grade (In the case of the students enrolled in October, June of the 4th grade)

The requirements for the aforementioned relevant papers are as follows: 1) They should be written in English and published in one of the "Journals written in English for academic degree application" designated by the faculty of Medical Sciences. 2) They must be written based on published papers which meet either requirement ① **or** ② listed below. Even if the papers are just on the passing line of IF, they can pass based on the synthetic judgment of the applicant's presentations and the answers to the questions.

①At least one of your papers should have been published as a first author in an academic journal whose IF is 5.0 or higher, or in an academic journal whose IF places in the top 10% of its particular field of research. (As for the details of IF and search strategies concerning these academic journals, please refer the Medical Faculty Educational Affairs Planning Section or the Website for the Graducate School of Medical Sciences, which is listed below as a link). However, any papers that have more than one first author will be evaluated with the IF number divided by the number of co-first-authors. Some co-first-authors are given the possibility to apply for doctoral degrees when they write a Thesis using the aforementioned paper as a relavant paper from a different view point. In the case of short communication, the decision for acceptance as a relevant paper is made after its content is reviewed.

②Two or more papers should have been published as a first author in an academic journal whose IF is 2.5 or higher, or in an academic journal whose IF places in the top 40% of its particular field of research. Alternatively, the sum of IF from two or more of these papers published as a first author should be 5.0 or higher. Candidates must have at least one paper published as a single first author, and the only one co-first-author paper is accepted. Any papers that have more than one first author will be evaluated with the IF number divided by the number of co-first-authors. In addition, some co-first-authors are given the possibility to apply for doctoral degrees when they write a Thesis using the aforementioned paper as a relavant paper from a different view point. In the case of short communication, the decision for acceptance as a relevant paper is made after its content is reviewed.

Guidelines for the degree review and details on how to apply for early graduation can be viewed in the department newsletter on the Website for the Graducate School of Medical Sciences (http://www.medphas.kumamoto-u.ac.jp/medgrad/keijiban/gakuitansyuku.html).
The website also provides detailed information on the IF of each scholarly journal, as well as the IF percentile analysis data.

8. Compulsory subjects and Elective subjects

A1・B1～B8・C1～C10
D1～D4

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
0	2016whole year	Graduate School of Medical Sciences(20010)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Medical Informatics and Medical Ethics(Medical Informatics and Medical Ethics)	USUKU Koichiro, Kasaoka Shunji, Kadooka Yasuhiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	The course is provided by lecture and discussion or e-Learning using the moodle or CITI Japan.
Class objectives	Medical Informatics and Medical Ethics aims at proper management of health information and ethical problems arose from medical practice. In this course, you learn basic concepts used in this filed, including electronic health records, protection of computer-processed personal data, health care system in Japan and other countries, evaluation of medical care and DPC, problems of abortion, euthanasia and death with dignity, informed consent, principle of ethics. This course serves as introductory for all students as you obtain essential knowledge on medical informatics and medical ethics, and emergency medicine.
Goals	To be able to handle or manage health information and ethical problems arose from medical practice.
Class outline	In order to explain basic principles of medical informatics and medical ethics, it is discussed how the problems are managed. Basic concepts are introduced. More specifically, you are expected to understand the followings: (1) electronic health records; (2) protection of computer-processed personal data; (3) information literacy; (4) ethical issues at the beginning of life; (5) ethical issues at the end of life; (6) informed consent, privacy and principle of ethics, (7) research, high technology medicine and ELSIs, (8) emergency medical service system and disaster medicine; (9) primary care and general medicine. Participants are requested to learn medical ethics through e-learning system offered by the project of Collaborative Institutional Training Initiative (CITI) Japan, or submit a short comment on some lectures, which will be helpful to provide positive feed back to the next session.

Each Summary

No.	Date	Theme	Summary
1	06/06	5th period Koichiro Usuku 【eE-0】【eJ-0】	Introduction and orientation of this course
2	06/13	5th period CITI Japan 【eEJ-0】	Responsible attitude of research, etc.
3	06/20	4th period CITI Japan 【eEJ-0】	Misappropriation, Conflict of Interest, etc
4	06/27	4th period CITI Japan 【eEJ-0】	Plagiarism,Peer Review, etc.
5	07/04	4th period CITI Japan 【eEJ-0】	Handling of Public Funds, etc.
6	07/11	4th period CITI Japan 【eEJ-0】	Personal Information, Informed Consent, etc.
7	07/25	4th period Koichiro Usuku【eE-0】【eJ-0】	Health care system in Japan and in the world
8	08/01	4th period Koichiro Usuku【eE-0】【eJ-0】	Clinical research using patients records, etc.
9	08/08	4th period Koichiro Usuku 【eE-0】【eJ-0】	Future prospects of Electronic medical records
10	08/22	4th period Koichiro Usuku 【eE-0】【eJ-0】	Clinical research and data ware hous
11	08/29	4th period Shunji Kasaoka 【eEJ-L】	Emergency Medical Service System, Post-Cardiac Arrest Syndrome
12	09/05	4th period Shunji Kasaoka 【eJ-L】	Disaster Medicine, Triage
13	09/12	4th period Yasuhiro Kadooka	Step up Lecture for Research Ethics (1)
14	09/26	4th period Yasuhiro Kadooka	Step up Lecture for Research Ethics (2)
15	10/03	4th period Yasuhiro Kadooka	Step up Lecture for Research Ethics (3)

Required Textbooks	Textbooks are not specified, and handouts will be distributed by the moodle system.
Reading list	Provided in the lectures.
Information concerning enrollment	No prerequisite.
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and questions related to the topics dealt with in class to be scored from grade 1 to 5. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions.
Language of instruction	else (detail in Activity)

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20020)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Pathophysiology and Structural Biochemis()	Mitsuyama Shiyoukei, YAMAGATA Kazuya, IRIE Tetsumi, NOMIYAMA Hisayuki, OGURA Teru, YAMANAKA Kunitoshi, Yorinaka Houichi, TAMAOKI Haruhiko

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged.
Class objectives	(1)To understand the pathophysiology of hypertension, cardiac hypertrophy, and atherosclerosis, and the therapeutic strategy of these cardiovascular diseases. (2)To understand the basic knowledge of glucose/lipid metabolism and its dysregulation in diabetes mellitus, metabolic syndrome, and lipid metabolism disorder. (3) Molecular basis, various cellular functions, and roles of ATPases, especially AAA family proteins, in human diseases will be learnt. (4) The specific properties of a protein arise from its particular conformational structure. The aim of this course is to understand the mechanisms of functional expression on the basis of the three-dimensional structures of proteins. (5) You will be able to understand the molecular interaction of functional carbohydrates with lipids and proteins, and to apply them to the field of life sciences.
Goals	To understand the structure, function, physiological role, role in various diseases, and clinical application of biomolecule, and to be able to explain them.
Class outline	(1) You will learn the mechanism for the regulation of oxidative stress and its signaling cascades. (2) You will learn fundamental metabolic pathways under normal conditions and its relationship to pathology. (3) Proteins are biopolymers containing functional motifs and domains. Molecular chaperones and ATP-dependent proteases are related to life of proteins and consist of several different types of ATPases. Their functions will be discussed from the point of view of ATPases. In particular, common molecular basis and various cellular functions of AAA family proteins will be discussed. In addition, human genetic diseases and developmental disorders of model animals caused by mutations in AAA family proteins will be described. (4) The structures and functions of chemokine involved in biological defense or process of organic formation are discussed. (5) The usefulness of carbohydrates in the fields of therapeutics and laboratory medicine will be discussed:

Each Summary

No.	Date	Theme	Summary
1	06/07	5th period Mitsuyama Shiyoukei 【eEJ-0】	Pathophysiology of cardiovascular diseases (1)
2	06/14	5th period Yorinaka Houichi 【eEJ-0】	Pathophysiology of cardiovascular diseases (2)
3	06/21	4th period Mitsuyama Shiyoukei 【eEJ-0】	Pathophysiology of cardiovascular diseases (3)
4	06/28	4th period YAMAGATA Kazuya 【eEJ-0】	Pathophysiology of glucose/lipid metabolism (1)
5	07/05	4th period YAMAGATA Kazuya 【eEJ-0】	Pathophysiology of glucose/lipid metabolism (2)
6	07/12	4th period YAMAGATA Kazuya 【eEJ-0】	Pathophysiology of glucose/lipid metabolism (3)
7	07/19	4th period OGURA Teru 【eEJ-0】	ATPases related to life of proteins
8	07/26	4th period YAMANAKA Kunitoshi 【eEJ-0】	Various functions of AAA proteins
9	08/02	4th period OGURA Teru 【eEJ-0】	Human diseases caused by AAA proteins
10	08/23	4th period TAMAOKI Haruhiko	Electronic and Structural Aspects of Flavoenzymes in β-Oxidation
11	08/30	4th period NOMIYAMA Hisayuki	Gene organization, physiological function and evolution of chemokine family (1)
12	09/06	4th period NOMIYAMA Hisayuki	Gene organization, physiological function and evolution of chemokine family (2)
13	09/13	4th period IRIE Tetsumi	Application of functional carbohydrates to the field of life sciences
14	09/20	4th period IRIE Tetsumi	Specific cells and biomolecules that are responsible for the wound healing
15	09/27	4th period IRIE Tetsumi	Failure of lipid metabolism and the laboratory medicine

Required Textbooks	Textbooks are not specified, and handouts will be distributed in some classes.
Reading list	“Harper's Illustrated Biochemistry” by Robert K. Murray, Daryl K. Granner, Victor W. Rodwell, The McGraw-Hill Companies, 2006 “Handbook of Lipoprotein Testing” by Nader Rifal et al., AACC Press, 2000
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on the student’s understanding of the course subject matter with active class participation, paper summaries, and the final report. The students' understanding will be evaluated on the basis of papers.
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20030)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Cell Biology()	TOMIZAWA Kazuhito, NAKAO Mitsuyoshi, NAKANISHI Hiroyuki, IWAMOTO Kazuya, TATEISHI Satoshi, SAITOH Noriko, ESAKI Masatoshi, WEI Fan-Yan

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Face-to face lecture & E-learning lecture
Class objectives	Cell Biology aims at understanding the following topics:(1) Intracellular signaling pathway such as protein phosphorylation in the pathogenesis of disease; (2) Chemical modifications of RNA; (3) Regularory mechanisms of cytoskeletons, subcellular organelle, nucleus and membranes in cell functions such as cell motility; (4) The molecular basis of epigenetic cell regulation in development and human diseases; and (5) Cell cycle, Mitosis and Meiosis, and DNA repair and recombination.
Goals	The goal of this course is that the students understand and elucidate the following topics: (1) Intracellular signaling pathway such as protein phosphorylation in the pathogenesis of disease; (2) Chemical modifications of RNA; (3) Regularory mechanisms of cytoskeletons, subcellular organelle, nucleus and membranes in cell functions such as cell motility; (4) The molecular basis of epigenetic cell regulation in development and human diseases; and (5) Cell cycle, Mitosis and Meiosis, and DNA repair and recombination.
Class outline	You learn basic concepts and techiniques in the filed of Cell Biology. Especilally, you are expected to understand the followings: (1) Cell homeostasis; (2) Molecular regulatory mechanism of cellularfunctions by RNA modifications; (3) Cytoskeletons and organelle play essential roles in varions cell functions such as cell motility, shape change, adhesion, and polarization; (4) Medical science-oriented epigenetics, especially mechanism of epigenetic regulation, involvement in human diseases such as psychiatric disorders and cancer, and new technologies for medical diagnosis and therapy; and (5) Cell cycle is regulated to maintain genomic DNA. Mitosis is a cell division in which the genomic DNA is replicated and distributed into the daughter cells. During meiosis, haploid gametes are produced with hereditary diversity. Genes are constantly damaged by endogenous or environmental factor, overall genomic structures and sequences are maintained by various DNA repair mechanisms.

Each Summary

No.	Date	Theme	Summary
1	06/09	5th period, TOMIZAWA Kazuhito 【eE-0, eJ-0】	Regulation in physiology and pathophysiology
2	06/16	5th period, TOMIZAWA Kazuhito 【eE-0, eJ-0】	Regulation by protein phosphorylation
3	06/23	4th period, WEI Fan-Yan 【eE-L】	Chemical modifications of RNA
4	06/30	4th period, SAITOH Noriko 【eE-0, eJ-0】	Structure and functions of the nucleus
5	07/07	4th period, ESAKI Masatoshi 【eE-0】	Organelle biogenesis and functions
6	07/14	4th period, NAKANISHI Hiroyuki 【eE-0,eJ-0】	Regulatory mechanism of cytoskeletons I
7	07/21	4th period, NAKANISHI Hiroyuki 【eJ-0】	Regulatory mechanism of cytoskeletons II
8	07/28	4th period, NAKANISHI Hiroyuki 【eE-0,eJ-0】	Cooperation of cytoskeletons and membranes
9	08/04	4th period, NAKAO Mitsuyoshi 【eJ-L*】*This lecture is provided with ‘eE’ in the lecture "Tokuron" #14 and #15 on the Course of Developmental Biology and Regenerative Medicine.	Medical epigenetics Ⅰ (General remarks)
10	08/25	4th period, NAKAO Mitsuyoshi 【eJ-L*】*This lecture is provided with ‘eE’ in the lecture "Tokuron" #14 and #15 on the Course of Developmental Biology and Regenerative Medicine.	Medical epigenetics Ⅱ
11	09/01	4th period, IWAMOTO Kazuya 【EJ-L】	About Neuroepigenetics I
12	09/08	4th period, IWAMOTO Kazuya 【EJ-L】	About Neuroepigenetics II
13	09/15	4th period, TATEISHI Satoshi 【eEJ-0】	Cell growth and cell cycle
14	09/29	4th period, TATEISHI Satoshi 【eEJ-0】	About Mitosis and Meiosis
15	10/06	4th period, TATEISHI Satoshi 【eEJ-0】	DNA repair and recombination

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	「Pathophysiology of Disease: An Introduction to Clinical Medicine, 6th Edition」edited by Stephan J. McPhee and William F. Ganong, The McGraw-Hill Companies (2009) 「Developmental Biology, 10th Edition」edited by Scott F Bilbert. Sinauer Associates Inc. (2013) 「Essential Cell Biology, 4th edition」edited by Bruce Alberts et al. Garland Science, (2013) 「EPIGENETICS」edited by David Allis et al. Cold Spring Harbor Laboratory Press (2007)
Information concerning enrollment	Should have the basic knowledge of cell biology.
Assessment methods and criteria/ratios	Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions.
Language of instruction	lecture in English + English textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20040)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Hematopoietic and Immune Systems(Hematopoietic and Immune Systems)	OKADA Seiji, Sashida Goro, NISHIMURA Yasuharu, Sato Yorifumi, OGAWA Minetaro, Senjiyuu Satoru, MAEDA Kazuhiko, SUZU Shinya, Takizawa Hitoshi

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	Omnibus lecures. E-learning contents are available in some lectures in both English and Japanese.
Course Goals	The goal of this lecture series is to understand the basis of hematopoietic and immune systems, and disruption of these systems (malignancy, immunodeficiency, and immune disorders).
Course Achievement Targets	Understand the basis of hematopoietic and immune systems, their development, function, disruption, and related diseases.
Outline	The aims of this lecture series are to understand the followings: (1) The mechanisms how the homeostasis of hematopoietic system is maintained as a stem cell system, (2) The origin of hematopoietic system and the mechanisms of development of hematopoietic stem cells, (3) The animal model bearing human hematopoietic system and applications of this animal model, (4) Aging and tumorigenesis of hematopoietic system, (5) Cell-cell interaction in the immune system, (6) The mechanism of antigen-recognition and the immune response

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1	06/10	5th period Minetaro Ogawa	Ontogeny of hematopoietic system-1
2	06/17	5th period Seiji Okada 【eJ-L,eE-L】	Differentiation of immune cells
3	06/24	4th period Minetaro Ogawa	Ontogeny of hematopoietic system-2
4	07/01	4th period Goro Sashida	Molecular mechanism of myeloid malignancies
5	07/08	4th period Minetaro Ogawa	Ontogeny of hematopoietic system-3
6	07/15	4th period Seiji Okada 【eJ-L,eE-L】	Application of Humanized mice
7	07/22	4th period Hitoshi Takizawa	Role of inflammation on hematopoiesis
8	07/29	4th period Yorifumi Sato	T-cell and retroviral infection
9	08/05	4th period Shinya Suzu	Differentiation of immune cells
10	08/26	4th period Hiroyuki Oshiumi	B cell development and function
11	09/02	4th period Hiroyuki Oshiumi	Role of innate immune cells during viral infection
12	09/09	4th period Hiroyuki Oshiumi	Development and function of innate lymphoid cells
13	09/16	4th period Yasuharu Nishimura 【eJ-0,eE-0,eEJ-0】	Antigen presentation to T cells
14	09/23	4th period Yasuharu Nishimura 【eJ-0,eE-0】	T cell-mediated anti-tumor immunity
15	09/30	4th period Satoru Senju 【eE-L】	iPS cell-based immune cell therapy

Textbooks/Materials	Textbooks are not specified, and handouts will be distributed.
Reading List	・"The Immune System" by Peter Parham. Garland Publishing Inc. New York and London, 2007 ・"Janeway' s Immunobiology Seventh Edition" by Kenneth Murphy, Paul Travers, Mark Walport. Garland Science, Taylor & Francis Group LLC. New York and Abingdon, 2008.
Enrollment Prerequisites	
Assessment Methods and Criteria	Achievement of the Objectives will be evaluated by active class participation and the reports, of which the theme will be specified after the lectures. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of the reports and brief examinations. Final grades will be based on the average of the best 10 scores of the reports and brief examinations as well as the participation in class discussions.
Language of Instruction	Instruction in English + English Textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20050)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Infection and Immune Control(Infection and Immune Control)	MATSUSHITA Shuzo, TAKIGUCHI Masafumi, Ariumi Yasuo, NAKATA Hirotomo, KAWAGUCHI Tatsuya, SAWA Tomohiro, Maeda Yousuke, UENO Takamasa, MIYAKAWA Toshikazu

Goals with their ratio
Under construction ‥‥100%

Type of Class	Lecture
Teaching Method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons. (Before starting this course students will be informed of the individual lecture style of instructors in detail.
Course Goals	The aim of this lecture series “Infection and Immune Control” is to learn following topics important for basic and clinical research of infectious diseases. (1) interaction between pathogen and host response,(2) molecular pathogenesis of viral infection, (3) immune control and vaccine development, (4) management of nosocomial/opportunistic infection, (5) diagnosis and treatment of emerging/re-emerging infectious diseases, (6) development of antiviral therapy based on the research in the life cycle of HIV-1, (7) Pathogenesis and treatment of HIV-1 infection.
Course Achievement Targets	Students will learn following topics important for basic and clinical research of infectious diseases. (1) interaction between pathogen and host response,(2) molecular pathogenesis of viral infection, (3) immune control and vaccine development, (4) management of nosocomial/opportunistic infection, (5) diagnosis and treatment of emerging/re-emerging infectious diseases, (6) development of antiviral therapy based on the research in the life cycle of HIV-1, (7) Pathogenesis and treatment of HIV-1 infection.
Outline	It would not be an overstatement if we say the history of mankind has been a long history of fight against infectious diseases. Researches on infectious diseases have been contributed enormously to the health and longevity of the life in developed nations at present. Development of the vaccine for the various infections, development of the antibiotics for bacterial infections and development of the anti-viral agents against chronic virus infection which had been difficult to manage have given a big impact to our society. These accomplishments have been based on accumulation of basic knowledge about pathogenic agents and elucidation of specific life cycle of them. The up-to-date research results including the lecturers’ own will be presented focusing on the following topics, the pathogenesis and the host response, life cycle of the virus and development of the effective anti-virus agents, and the development strategy of the vaccine that overcomes the escape from the immune response.

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1	06/06	6th period Tomohiro Sawa 【eJ-0】	Infection and host response 1
2	06/13	6th period *Tomohiro Sawa 【eJ-0】	Infection and pathogenic organisms
3	06/20	5th period Tomohiro Sawa 【eE-0】	Infection and host response 2
4	06/27	5th period Yosuke Maeda	Molecular pathogenesis of viral infection I
5	07/04	5th period *Yosuke Maeda 【eE-L】	Molecular pathogenesis of viral infection II
6	07/11	5th period *Yosuke Maeda 【eE-L】	Molecular pathogenesis of viral infection III
7	07/25	5th period Masafumi Takiguchi 【eE-0】	Infection and host immune response
8	08/01	5th period *Takamasa Ueno	Cellular immune response against HIV-1
9	08/08	5th period Takamasa Ueno	Vaccine development against infectious diseases
10	08/22	5th period *Tatsuya Kawaguchi	Nosocomial/opportunistic infection
11	08/29	5th period Toshikazu Miyakawa	Emerging/re-emerging infectious diseases
12	09/05	5th period Hirotomo Nakata	Antiviral therapy against HIV-1 infection/AIDS
13	09/12	5th period Yasuo Ariumi	Host factors in HIV infection
14	09/26	5th period *Shuzo Matsushita	Pathogenesis and treatment of HIV-1 infection
15	10/03	5th period Shuzo Matsushita 【eE-L,eJ-0】	Humoral immune response against HIV-1

Textbooks/Materials	Textbooks are not specified, and handouts will be distributed.
Reading List	“Atlas of AIDS” edited by Gerald L. Mandell and Donna Mildvan. Current Medicine, Inc. Philadelphia, 2001. “Infectious Diseases and Medical Microbiology” 2nd Edition, Abraham I. Braude et al., W.B. Saunders Company
Enrollment Prerequisites	
Assessment Methods and Criteria	This class consisted of a series of omnibus lectures by five groups of lecturers responsible for three successive lectures listed in the schedule. Evaluation will be done by each group based on active class participation, examination test and/or report for subjects prepared by the chief of the group. In order to get credits students have to take more than 2/3 lectures to get scores at least from 3 groups in 5. Grading will be based on averaging three higher scores among ones obtained by the student. The chief of individual lecture group are indicated with * mark in the following table.
Language of Instruction	Instruction in English + English Textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20060)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Human Brain Functional Science(B5 Human brain function science)	TAMAMAKI Nobuaki, SHIMAMURA Kenji, SONG Wen-Jie, IKEDA Manabu, FUJISE Noboru

Goals with their ratio
Under construction ‥‥100%

Type of Class	Lecture
Teaching Method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Course Goals	A highly complex structure, human brain is developed from a simple central nervous system (CNS) that detects environmental information and uses the information directly for its body response. Human brain achieved memory, cognition, spirit and identity in its structure by increasing number of neurons and number of subtypes of neurons. In this lecture series, 'Human brain functional Science', we will try to show you how mental activity appears from 'gene expression', neuron electrical activity, information convergence and divergence in the neuronal circuit. We will inspect hypotheses proposed on the mechanisms to produce brain function. Finally we will speculate the intrinsic brain mechanisms by using mental disorders as clues.
Course Achievement Targets	We will show you and discuss with you on the molecular mechanisms of induction of neural plate and regionalization. Molecular mechanisms of differentiation and process of morphogenesis will be shown into detail. You will learn how environmental information is conveyed to human brain region and used for information processing and cognition. You will also learn neuronal basis for mental activity.
Outline	We will show and discuss on the points: molecular mechanisms of induction of neural plate and regionalization. Molecular mechanisms of differentiation and process of morphogenesis will be shown into detail. You will learn how environmental information is conveyed to human brain region and used for information processing and cognition. You will also learn neuronal basis for mental activity.

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1	06/07	6th period SHIMAMURA 【eE-0,eJ-0】	Neural induction
2	06/14	6th period SHIMAMURA 【eE-0,eJ-0】	Regionalization of brain
3	06/21	5th period SHIMAMURA 【eE-0,eJ-0】	Morphogenesis in individual region
4	06/28	5th period TAMAMAKI 【eE-0,eJ-0】	Structure of neurons
5	07/05	5th period SONG 【eE-0,eJ-0】	Action potential
6	07/12	5th period SONG 【eE-0,eJ-0】	Synapse and synaptic transmission
7	07/19	5th period SONG 【eE-0,eJ-0】	Neurotransmitter
8	07/26	5th period SONG 【eE-0,eJ-0】	Synaptic plasticity
9	08/02	5th period TAMAMAKI 【eE-0,eJ-0】	Modulation of neural activity by amine
10	08/23	5th period TAMAMAKI 【eE-0,eJ-0】	Neuronal network in the neocortex
11	08/30	5th period TAMAMAKI 【eE-0,eJ-0】	Mental activity raised from circuit mechanisms
12	09/06	5th period IKEDA 【eJ-0】	Multiple approaches to mental disorder
13	09/13	5th period FUJISE 【eE-0,eJ-0】	Neurotransmitter and mental symptom
14	09/20	5th period IKEDA 【eJ-0】	Neural basis of mental disorder
15	09/27	5th period IKEDA 【eJ-0】	Neural basis of dementia

Textbooks/Materials	Not specified.
Reading List	Not specified
Enrollment Prerequisites	
Assessment Methods and Criteria	Rate of finished e-Learning. Points earned by passing short examinations.
Language of Instruction	Instruction in English + English Textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
20070	2016whole year	Graduate School of Medical Sciences(20070)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Neuroscience()	FUKUDA Takaichi, ERA Takumi, OOTA Kunimasa, INDOU Yasuhiro, MAKINO Keishi, ITOU Yasuhiro, INOUE Toshihiro, MINODA Riyousei, YAMASHITA Satoshi

Goals with their ratio
Under construction ····100%

Type of Class	Lecture
Teaching Method	PowerPoint will be used in the lectures.
Course Goals	In this course, you learn molecular basis of the development of the nervous system, malformation of the brain due to the abnormalities in development, structure and function of diverse synapses, pathophysiology in the sensory systems, and neurodegenerative disorders. Recent advances in the therapeutic approaches including regenerative medicine are discussed.
Course Achievement Targets	Students can explain the development of nervous system and its abnormalities, diverse mode of synaptic transmission, new therapeutic approaches to the neural disorders using stem cells and gene targeting, pathophysiology in the somatosensory, visual, and auditory systems and their treatments.
Outline	(1) Formation of neural tube, regionalization along the dorsoventral and rostrocaudal axes; (2) Asymmetrical division during mitosis, stem cells, cell lineage (3) Axonal guidance; (4) Morphogenesis of eyes and neural stem cell; (5) Morphology and function of diverse synapses including gap junctions; (6) Neural crest cells and pluripotency; (7) Nerve growth factor and apoptosis; (8) Gene abnormality and the resultant congenital insensitivity to pain; (9) Deformity of central nervous system and treatment; (10) Pathophysiology and treatment of retinal diseases; (11) Glaucoma pathophysiology and treatment; (12) Hearing impairment and treatment; (13) Regenerative medicine for neurodegenerative diseases; (14) State-of-the-art therapies for Parkinson's diseases

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1	06/08	4th period, OOTA Kunimasa [eE-0]	Axon guidance and the neural cells migration
2	06/15	4th period, OOTA Kunimasa [eE-0]	Identification of axonal guidance molecules
3	06/22	4th period, OOTA Kunimasa [eE-0]	Eye formation and neural stem cell
4	06/29	4th period, OOTA Kunimasa [eE-0]	Finding signaling molecule Tsukushi
5	07/06	4th period, FUKUDA Takaichi [eJ-0,eE-0]	Structure and diversity of chemical and electrical synapses
6	07/13	4th period, ERA Takumi [eJ-0,eE-0]	Development and differentiation of neural crest cell, pluripotency
7	07/20	4th period, ERA Takumi [eJ-0,eE-0]	New medical application to diseases of the nervous system using stem cell
8	07/27	4th period, INDO Yasuhiro [eJ-0,eE-0]	Nerve growth factor and apoptosis
9	08/03	4th period, INDO Yasuhiro [eJ-0,eE-0]	Identification of the gene responsible for congenital insensitivity to pain with anhidrosis (CIPA)
10	08/24	4th period, MAKINO Keishi [eJ-0]	Deformity of central nervous system and treatment
11	08/31	4th period, ITOU Yasuhiro [eE-L]	Pathology and treatment of retinal diseases
12	09/07	4th period, INOUE Toshihiro [eE-0]	Glaucoma pathophysiology and therapy
13	09/14	4th period, MINODA Riyousei [eE-0]	Hearing impairment and the treatment
14	09/21	4th period, YAMASHITA Satoshi	Regenerative medicine for neurodegenerative diseases
15	09/28	4th period, YAMASHITA Satoshi	State-of-the-art therapies for Parkinson's diseases

Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The students' understanding will be evaluated on the basis of quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average of the 10 highest scores out of 15 quizzes.
Language of Instruction	Instruction in Japanese + Japanese Textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20080)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Developmental and Regenerative Medicine()	NISHINAKAMURA Ryuichi, KAWAI Katsushi, Era Takumi, Fukuda Takaichi, ARAKI Masatake, NAKAGATA Naomi, Hitoshi Niwa, Masaki Okano, Atsuhiro Taguchi, Akira Nakamura

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged.
Class objectives	Developmental and regenerative medicine aims at curing diseases by revealing molecular mechanisms of organ development. In this course, you learn basic concepts and techniques used in this filed, including knockout mice, which have now become essential for any area of research. This course serves as introductory for those in the Developmental and Regenerative Researcher Program, and will also be useful for those in other programs, as you obtain essential knowledge on genetic engineering techniques.
Goals	learn basic concepts and techniques used in this filed, including knockout mice, which have now become essential for any area of research.
Class outline	(1) Establishment and application of stem cells including ES and iPS cells; (2) Reproductive engineering including in vitro fertilization, freezing of embryos and sperms, embryo transfer, intracytoplasmic sperm injection, and nuclear transfer; (3) Methods to generate transgenic and knockout mice, as well as genome editing technology; (4) Comprehensive mutagenesis projects in mice and how to use the resources; (5) Gene modification using Cre-loxP technology; (6) Anatomy of each organ in the aspects of ontogeny and phylogeny; (7) Axis formation and pattering at the initial stages of development; (8) Molecular mechanisms of organ development including the liver, pancreas and kidney; (9) Trials for regenerating organs.

Each Summary

No.	Date	Theme	Summary
1	06/09	6th period Ryuichi Nishinakamura 【eE-L】	Developmental and regenerative medicine
2	06/16	6th period Masatake Araki 【eEJ-L】	Transgenic mouse, Knockout mouse
3	06/23	5th period Masatake Araki 【eEJ-L】	Production of genome edited mouse line
4	06/30	5th period Akira Nakamura【eE-L】	germ cell formation: preformation and epigenesis
5	07/07	5th period Masaki Okano 【eE-L】	Epigenetics in development
6	07/14	5th period Atsuhiro Taguchi 【eE-L】	Kidney development and regeneration
7	07/21	5th period Naomi Nakagata 【eE-0】	Reproductive engineering I
8	07/28	5th period Naomi Nakagata【eE-0】	Reproductive engineering II
9	08/04	5th period Hitoshi NIwa 【eE-0】	Molecular basis of embryonic stem cells I
10	08/25	5th period Hitoshi Niwa【eE-0】	Molecular basis of embryonic stem cells II
11	09/01	5th period Takumi Era 【eE-0】	iPS cells, their applications for the medicine
12	09/08	5th period Takumi Era【eE-0】	Mesoderm induction from ES cells
13	09/15	5th period Takaichi Fukuda 【eE-0】	Ontogeny and phylogeny
14	09/29	5th period Katsushi Kawai 【eE-0】	Anatomy of digestive tracts and lung
15	10/06	5th period Takaichi Fukuda 【eE-0】	Anatomy of cardiac and urogenital systems

Required Textbooks	
Reading list	・ “Developmental Biology, 10th edition” by Scott Gilbert 2013. ・ “Essential Developmental Biology, 3rd edition” by Slack JMW.,Blackwell Publishing 2012 ・ “Manipulating the Mouse Embryo: A Laboratory Manual, 4th edition” by Nagy A., Gertsenstein M., Vintersten K., Behringer R., Cold Spring Harbor Laboratory Press, 2014. ・ “Larsen’s Human Embryology, 5th edition” by Shoenwolf GC, Bleyl SB, Brauer PR, Francis-West PH. Churchill Livingstone, 2014.
Information concerning enrollment	
Assessment methods and criteria/ratios	The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes, as well as the final report and active participation in class discussions.
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20090)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Environmental and Sociomedical Sciences(B8 Environmental and Sociomedical Sciences)	Nishitani Yoko, Katoh Takahiko, KITANO Takao, SOEJIMA Hirofumi, Wei Changnian, Oomori Hisamitsu, Minamoto Keiko

Goals with their ratio
Under construction ‥‥100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	The purpose of this course is to develop the logic of the broad field of Social Medicine from the viewpoints of preventive and environmental medicine (hygiene), public health, health medicine, forensic medicine and neuropsychiatry.
Goals	Social Medicine is an important field of medical science in studying various aspects of the interaction between medicine and society in the human life cycle. The health of the humans is regulated in the ecosystem, and, as the medical social application, it is also supported by the comprehensive health and welfare system. In this course, students are expected to understand the relationship between the environment and health, the concept of total medical care service including disease prevention & health promotion, and individuals' basic human rights. Students will also comprehensively learn the role of medicine and law in maintaining social safety.
Class outline	There will be practical lectures in the Department of preventive and environmental medicine (hygiene) on the structure of the environment, the relationship between people and the environment, environmental indices and evaluation, and the setting and maintenance of environmental standards, and lectures in the Department of Public Health on the concept of health and the construction of a healthy society based on preventive medicine and epidemiology. In the Department of Forensic Medicine, there will be general lectures on the purposes of forensic medicine, as well as the causes of the death and its classification from the medical, legal and social perspectives, and forensic medicine's contribution to society. In the Department of Clinical Behavioral Medicine, students will learn about the epidemiology of mental diseases and the relationship between life-events, social support, personality, recognition pattern, nurture experience and mental disease.

Each Summary

No.	Date	Theme	Summary
1	06/10	6th period Takahiko Katoh 【eE-0, eJ-0】	Meaning of social medicine
2	06/17	6th period Keiko Minamoto【eE-L, eJ-0】	Occupational skin disease (1)
3	06/24	5th period Hisamitsu Omori【eE-L】	Public Health: Medical Screening
4	07/01	5th period Hirofumi Soejima【eE-L】	General Medicine: Atherosclerosis
5	07/08	5th period Hirofumi Soejima【eE-0, eJ-L】	Blood Coagulation and Fibriolysis
6	07/15	5th period Yoko Nishitani 【eE-L, eJ-0】	Definition and purpose of forensic medicine
7	07/22	5th period Hirofumi Soejima【eE-0, eJ-L】	Lifestyle and Coronary Artery Disease
8	07/29	5th period Yoko Nishitani 【eE-L, eJ-0】	Forensic medicine & forensic science
9	08/05	5th period Yoko Nishitani 【eE-L, eJ-0】	Social aspect of human death (1)
10	08/26	5th period Yoko Nishitani 【eE-L, eJ-0】	Social aspect of human death (2)
11	09/02	5th period Changnian Wei 【eE-L, eJ-0】	Environment-human system
12	09/09	5th period Changnian Wei【eE-L, eJ-0】	Environmental indices and evaluation
13	09/16	5th period Takahiko Katoh 【eE-L】	Public Health: Epidemiology
14	09/23	5th period Keiko Minamoto【eE-L, eJ-0】	Occupational skin disease (2)
15	09/30	5th period Takao Kitano【eE-L】	Life style and health risk

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	・ "Public Health & Preventive Medicine" by Maxy-Rosenan-Last: (14 edit) Appleton & Lange. 1998, ・ "Forensic Pathology" by Bernard Knight, 2nded.., Arnold, London, Sydney and Auckland, 1996.
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions
Language of instruction	else (detail in Activity)

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20100)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Current Theory of Medical Diagnosis(Current Theory of Medical Diagnosis)	Matsui Hirotaka, Mikami Yoshiki, Takeya Motohiro, Kojima Akihiro, Imamura Takahisa, Yamashita Yasuyuki, Itou Takaaki, Jono Hirofumi

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	PowerPoint files will be used for giving the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures will be considered for those who are regularly absent for unavoidable reasons.
Course Goals	The lecture series “Current Theory of Medical Diagnosis” afford fundamental and current general views of modern medical diagnostic techniques and their application in practical medicine and medical research.
Course Achievement Targets	This course has been projected for the achievement of knowledge regarding the cutting-edge advanced method for disease diagnosis.
Outline	In the field of Pathology, current morphology and its application for cancer diagnosis will be introduced. In addition, molecular approaches for a research in cancer cell differentiation, proliferation and invasion, blood coagulation system and immune reaction (especially on macrophage) will be shown. In the field of Laboratory Medicine, a modern technique and method for the detection of gene mutations will be shown and be discussed. In the field of Diagnostic Radiology, detailed implication of CT and MRI images and their application for researchers will be presented. In the field of Isotope Science, principles of RI tracer methods that are able to detect RI distribution in functional assay as well as in animals including human body will be presented.

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1	02/07	4th period Ito T (Pathol Exp Med) 【eJ-L】	Tumor diagnosis with immunohistochemistry.
2	02/10	4th period Ito T (Pathol Exp Med) 【eJ-L】	Molecular pathological diagnosis.
3	02/14	4th period Mikami Y (Pathol Diagnosis)	Histopathologic approach to diagnostic oncology: a logic for interpretation of morphology.
4	02/17	4th period Imamura T (Mol Pathol) 【eJ-0】	Cross-talk between inflammatory and immune reactions and the blood coagulation system.
5	02/21	4th period Imamura T (Mol Pathol) 【eJ-0】	Protease virulence activities and the mechanisms.
6	02/24	4th period Takeya M (Cell Pathol) 【eJ-0】 【eE-0】	Role of macrophages in huma diseases.
7	02/28	4th period Takeya M (Cell Pathol) 【eJ-0】 【eE-0】	Methods for macrophage researches.
8	03/03	4th period Matsui (Laboratory Medicine) 【eJ-0】	Application of next generation sequencing for clinical diagnosis
9	03/07	4th period Matsui H (Laboratory Medicine) 【eJ-0】	Practice and prospect of clinical diagnostic medicine
10	03/10	4th period Jono H (Clin Pharm Sci) 【eJ-0】	Pathophysiological analyses with cell biological methods.
11	03/14	4th period Yamashita (Diag Radiolo) 【eJ-0】	Radiological images of representative diseases.
12	03/17	4th period Yamashita Y (Diag Radiolo) 【eJ-0】	Application of radiological diagnosis for researches
13	03/21	4th period Kojima A (RI Sci) 【eJ-L】	RI tracer methods: basics and application of radioisotope measurements.
14	03/24	4th period Kojima A (RI Sci) 【eJ-L】	RI molecular imaging.--
15	03/28	4th period Matsui H (Laboratory Medicine)	Makeup class for students who did not attend previous classes

Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	Grading will be based on active class participation, paper summaries and the final reports. Even if the attendance in this course is very poor or none, the students can obtain credits for this course through e-learning system that are prepared in some classes, or a supplemental class. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics and be scored from 0 to 100.
Language of Instruction	Instruction in Japanese + Japanese Textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20110)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Advanced Therapeutics(Advanced therapeutics for a variety of diseases)	SASAKI Yutaka, In Hironobu, INOMATA Yukihiro, YUMOTO Eiji, Etou Masatoshi, Kourogi Hirotsugu

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義・演習
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged.
Class objectives	Basic concept of molecular targeting and clinical application using antibody, peptide will be reviewed. Because the relation between immune disorders and pathogenesis has been revealed, immune modulation serve as a therapeutic strategy for viral infectious diseases, auto-immune diseases, and cancer. This course provides a rationale, current evaluation and problems of immune-modulation therapy. On the other hand, this course will introduce the basic research and progress to the establishment of organ transplantation, cell transplantation and artificial organs, and also focus on the current efficacy and limitations. In addition, progress in endoscopic treatments will be reviewed. Future therapeutic strategies wil be also discussed.
Goals	To understand a rationale, current evaluation and problems of immune-modulation therapy. In addition, to comprehend the basic research and progress to the establishment of organ transplantation, cell transplantation and artificial organs, and also to know the current efficacy and limitations. Finally, progress in endoscopic treatments will be recognized.
Class outline	Recent advances in molecular biology and medical engineering provide a new era in the treatment of various diseases. In this regard, the molecules, which play central roles in the pathogenesis of chronic inflammation and carcinogenesis, have been identified, leading to the development of molecular targeting therapies. In addition, it has been described how immune systems of the body contribute to pathogenesis of diseases, and immune-modulation has been employed in the clinical setting. Furthermore, organ transplantation, cell transplantation and artificial organs have been introduced to complement organ failures. On the other hand, progresses in endoscopic machinery have established endoscopic treatment, and serve as less invasive treatments. This course will focus on progress in treatments and future orientation of medicine.

Each Summary

No.	Date	Theme	Summary
1	02/07	5th period Yutaka Sasaki 【eJ-0】	Progress in endoscopic treatment of gastrointestinal diseases
2	02/10	5th period Yutaka Sasaki 【eJ-0】	Molecular target therapy in gastrointestinal diseases
3	02/14	5th period Yutaka Sasaki 【eJ-0】	Immune disorders in gastrointestinal & hepatic diseases
4	02/17	5th period Hirotsugu Kohrogi 【eJ-0】	Progress in diagnosis and treatment of respiratory diseases
5	02/21	5th period Hirotsugu Kohrogi 【eJ-0】	Topics of allergic respiratory diseases
6	02/24	5th period Hirotsugu Kohrogi 【eJ-0】	Topics of diagnosis and treatment of lung cancer
7	02/28	5th period Ryosei Minoda 【eJ-0】	Progress in diagnosis and treatment of dysphagia
8	03/03	5th period Ryosei Minoda 【eJ-0】	Cochlear implant as the treatment for deafness
9	03/07	5th period Ryosei Minoda 【eJ-0】	Endoscopic treatment of head and neck diseases
10	03/10	5th period Yukihiro Inomata 【eJ-0】	Organ transplantation; the past and the present
11	03/14	5th period Yukihiro Inomata 【eJ-0】	Liver transplantation; basis and clinical application
12	03/17	5th period Yoshiaki Kawano 【eJ-0】	Current therapeutic strategy for urogenital cancers
13	03/21	5th period Yoshiaki Kawano 【eJ-0】	Endoscopic treatments for urinary diseases
14	03/24	5th period Hironobu Ihn 【eJ-0】	Molecular mechanisms of autoimmune diseases in skin
15	03/28	5th period Hironobu Ihn	Immune disorders in skin diseases

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	1) Molecular Cell Biology, sixth edition, by Lodish H, et al. W.H.Freeman, 2008 2) Carithers RL Jr. Liver transplantation. American Association for the Study of Liver Diseases. Liver Transpl 2000 Jan;6 (1):122-35.
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, understanding, paper summaries, and the final report.The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20120)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Metabolic and Circulatory Regulations(Metabolic and Circulatory Regulations)	ARAKI Eiichi, Yamamoto Tatsuo, Mukouyama Masashi, Gotou Tomomi, Oike Yuuichi, Kaikita Kouichi, Hokimoto Seiji

Goals with their ratio
Under construction ‥‥100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	Aim of this course is to learn following items, 1. the pathogenesis of acute coronary syndrome (ACS) and related factors, 2. the significance of personalized medicine by stratification of patients with ACS by evaluating genetic and environmental factors, 3. the pathogenesis of diabetes mellitus and diabetic vascular complications, and its therapeutic strategy, 4. the molecular mechanism of effects or secretion of insulin, 5. the molecular mechanism and therapeutic strategy for metabolic syndrome and the development of obesity, 6. the relation between the progression of atherosclerosis or obesity, and inflammatory cells, 7. the physiological renal function, the functional differentiation and regulation in each segment of nephron, 8. the pathogenesis of major renal diseases and the underlining mechanisms causing the pathological conditions, 9. influence and the mechanism of the operative stress to the metabolism and circulation, and therapeutic strategy for controlling these influences.
Goals	Students should be able to explain followings; 1. Platelet activation, and the coagulation and fibrinolytic biomarkers in acute coronary syndrome. 2. Basic mechanism of myocardial ischemia/reperfusion injury and cardiac remodeling. 3. Personalized medicine by stratification of patients with acute coronary syndrome by evaluating genetic and environmental factors. 4. Pathogenic mechanism of diabetes mellitus, diabetic complications. Insulin acrion and secretion. 5. Molecular mechanism and therapeutic strategy for metabolic syndrome and the development of obesity as the major pathogenesis of atherosclerosis 6. Detailed molecular structure, channels and receptors, and the regulation of nephron. 7. Functional renal changes to the renal blood flow and blood pressure, and the pathogenic mechanism of proteinuria and renal dysfunction. 8. Various influences by operative stress to the metabolism and circulation, and therapeutic strategy in based on understanding these influences.
Class outline	1. Platelet activation, and the coagulation and fibrinolytic biomarkers in acute coronary syndrome. 2. Basic mechanism of myocardial ischemia/reperfusion injury and cardiac remodeling in experimental acute myocardial infarction. 3. Personalized medicine by stratification of patients with acute coronary syndrome by evaluating genetic and environmental factors. 4. Pathogenic mechanism of diabetes mellitus, diabetic complications, effects and secretion defect of insulin. 5. Molecular mechanism and therapeutic strategy for metabolic syndrome and the development of obesity, as the major pathogenesis of atherosclerosis. 6. Detailed molecular structure, channels and receptors, and the regulation of nephron. 7. Functional renal changes to the renal blood flow and blood pressure, and the pathogenic mechanism of proteinuria and renal dysfunction. 8. Various influences by operative stress to the metabolism and circulation, and therapeutic strategy in based on understanding these influences.

Each Summary

No.	Date	Theme	Summary
1	10/14	Fri. 5th period Koichi Kaikita 【eE-0】	Mechanism of myocardial ischemia / repefusion injury.
2	10/21	Fri. 5th period Seiji Hokimoto	Personalized medicine by genetic and environmental factors.
3	10/28	Fri. 5th period Hisao Ogawa 【eE-0】	Platelet activation, coagulation and fiblinolysis in acute coronary syndrome.
4	11/04	Fri. 5th period Tatsuo Yamamoto	Types and influences of operative stress.
5	11/11	Fri. 5th period Tomomi Gotoh 【eE-0,eJ-0】	NO and nitrogen metabolism disorders.
6	11/18	Fri. 5th period Eiichi Araki 【eE-0】	Insulin and its action –their molecular basis.
7	11/25	Fri. 5th period Eiichi Araki 【eE-0】	Diabetic complications and their therapeutic approaches.
8	12/02	Fri. 5th period Tatsuo Yamamoto	Physiological mechanism of influences by operative stress.
9	12/09	Fri. 5th period Tatsuo Yamamoto	Therapeutic strategy controlling operative stress.
10	12/16	Fri. 5th period Yushi Nakayama 【eE-0】	Structure and function of nephron.
11	01/06	Fri. 5th period Masashi Mukoyama 【eE-0】	Sodium handling by the kidney.
12	01/13	Fri. 5th period Masataka Adachi	Potassium handling by the kidney.
13	01/20	Fri. 5th period Eiichi Araki	Pathogenesis and therapies in metabolic disorder.
14	01/27	Fri. 5th period Tomomi Gotoh 【eE-0,eJ-0】	ER stress-related diseases.
15	02/03	Fri. 5th period Yuichi Oike	Molecular pathogenesis of life-style diseases.

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	“Braunwald’s Heart Disease: A Text of Cardiovascular Medicine, Eight edition” edited by Libby P et al. Saunders Press, Philadelphia, 2007. “Miller’s Anesthesia, sixth edition” edited by Miller RD. Elsevier Churchill Livingstone, Philadelphia, 2005. “Brenner & Rector’s The Kidney 10th edition, Elsevier, 2016

Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20130)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Reproductive and Developmental Medicine()	NAKAMURA Kimitoshi, KATABUCHI Hidetaka, OHBA Takashi, MITSUBUCHI Hiroshi,

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	
Class objectives	The lecture of “Reproductive and developmental medicine” aims to understand followings: (1) Basic knowledge for physiology and pathology of human fertilization and pregnancy. (2) Medical interventions before and during pregnancy, and social issues related to these interventions. (3) Basic knowledge for physiology and pathology of development and growth of man. (4) Basic knowledge for disorders which affects children including genetic diseases.
Goals	
Class outline	This class will introduce the most recent and important progress in the field of reproductive and developmental medicine. The lecture related to pregnancy and delivery will discuss medical and social issues in addition to the physiology of reproductive system. Maturation of eggs is the important step for fertilization, and function of placenta is another important factor for normal development of fetus. We will discuss biological and medical aspect of the reproductive system, and social and ethical problems. The ethical problems of assisted fertilization including in vitro fertilization, ICSI (Intra Cytoplasmic Sperm Injection), oocyte donation, cryopreservation of embryos, cryopreservation of sperm will be discussed. The class for neonatal medicine, we introduce principal physiology of newborn infants and various pathological conditions of this period. The participant will learn many different disorders. One of the important topic of this course is normal development of brain function during childhood. The normal development of young brain is supported by surrounding environment of children which included social conditions. We will discuss the social problems which affect healthy development of children in recent years.

Each Summary

No.	Date	Theme	Summary
1	10/13	5th Period. Kimitoshi Nakamura	Inborn errors of metabolism
2	10/20	5th Period. Yasuhiro Indo 【eE-L】	Molecular Genetics of Congenital Insensitivity to Pain
3	10/27	5th Period. Tadashi Matsubasa	Medical aspects of Severe Motor and Intellectual Disabilities
4	11/10	5th Period. Kimitoshi Nakamura	Eerly didgnosis of disorders for children
5	11/17	5th Period. Yasuhiro Indo	Nerve Growth Factor, Interoception and Emotion: Lessons from Congenital Insensitivity to Pain with Anhidrosis
6	11/24	5th Period. Takashi Ohba	Pathogenesis, treatments and prevention of preterm labor
7	12/01	5th Period. Kimitoshi Nakamura	Metabolic syndrome in childhood
8	12/08	5th Period. Hidetaka Katabuchi 【eJ-0】	Placental physiology and pathology
9	12/15	5th Period. Ritsuo Honda	Disorders of sex development
10	12/22	5th Period. Makoto Matsukura 【eE-0】	Developmental Disorder - Problems in Medical Diagnosis and its Resolution -
11	01/12	5th Period. Takashi Ohba	prenatal diagnosis and ethics
12	01/19	5th Period. Yoshinori Okamura	Assisted reproduction update
13	01/26	5th Period. Masanori Iwai	Recent neonatal intensive care anf new strategies for neonatal hypoxic ischemic brain injury
14	02/02	5th Period. Shiro Matsumoto	Pathophysiological investigation for Inborn error of metabolism with iPS method.
15	02/09	5th Period. Hiroshi Mitsubuchi	Congenital abnormalities and genetic counseling

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20140)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Advances in Oncologic Medicine()	Suzuki Makoto, ARAKI Norie, BABA Hideo, NAKAYAMA Hideki

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	To understand advances in oncologic medicine, this course serves evidences and recent findings of medical oncology as follows:
Goals	To understand advances in oncologic medicine, this course serves evidences and recent findings of medical oncology as follows: (1) Overview of tumor biology and genetics; (2) Recent advances in gastroenterological surgery; (3) Recent advances in oral and maxillofacial surgery; (4) Recent advances in thoracic surgery
Class outline	This course overviews landmark findings in mechanism of tumor genesis and recent developments, and serves some of leading-edge research and our data. We focus on following topics: molecular mechanisms of tumor-related genes, cell cycle, cell death, cell differentiation; therapeutic agents based on tumor biology; molecular diagnostic tools, genome, transcriptome and proteomics; cancer stem cell. Many people suffer from gastroenterological cancers (esophageal, gastric, colon, pancreas, liver, billiary tract and gastrointestinal stromal tumor). We explain not only standard treatment for gastroenterological cancer but also cutting-edge treatment for refractory or metastatic, or recurrent gastroenterological cancer.

Each Summary

No.	Date	Theme	Summary
1	10/11	(Tue) 4th period Norie Araki 【eJ-0】	Tumor Genetics and biology (introduction)
2	10/18	(Tue) 4th period Norie Araki 【eJ-0】	Tumor Genetics and biology 1
3	10/25	(Tue) 4th period Norie Araki 【eJ-0】	Tumor Genetics and biology 2
4	11/01	(Tue) 4th period Hideo Baba 【eJ-0】	Gastroenterological surgery (introduction)
5	11/08	(Tue) 4th period Hideo Baba 【eE-0】	Gastroenterological surgery 1
6	11/15	(Tue) 4th period Hideo Baba 【eJ-0】	Gastroenterological surgery 2
7	11/22	(Tue) 4th period Hideo Baba 【eE-0】	Gastroenterological surgery 3
8	11/29	(Tue) 4th period Hideo Baba 【eE-0】	Gastroenterological surgery 4
9	12/06	(Tue) 4th period Hideo Baba 【eE-0】	Gastroenterological surgery 5
10	12/13	(Tue) 4th period Hideki Nakayama【eJ-0】	Oral and maxillofacial tumors
11	12/20	(Tue) 4th period Hideki Nakayama【eJ-0】	Diagnosis and treatment of oral cancer
12	01/10	(Tue) 4th period Hideki Nakayama【eJ-0】	Challenges in oral cancer treatment
13	01/17	(Tue) 4th period Makoto Suzuki 【eE-0】	Thoracic surgery (introduction)
14	01/24	(Tue) 4th period Makoto Suzuki 【eJ-0】	Lung cancer ----------
15	01/31	(Tue) 4th period Makoto Suzuki 【eE-0】	Medistinal tumor ---------

Required Textbooks	Textbooks are not specified.
Reading list	“Natural obsessions:The search for the oncogene” by Angier. N, Houghton Mifflin Co, 1988. “Cancer: principles & practice of oncology, 7th ed” by DeVita VT, Lippincott Williams & Wilkins.2004 “The biology of cancer” by Weinberg RA Garland Science, 2007. “Clinical Oncology.” by Abeloff MD, Churchill Livingstone, . “ACS surgery: principles and practice” by Wilmore DW, WebMD. ・ “Thoracic Surgery, 2nd edition ” by Pearson FG, Churchill Livingstone, 2002
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries,and final report.
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20150)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
The Forefront of Clinical Oncology()	OYA Natsuo, MATSUNO Naofumi, MITSUYA Hiroaki, NAKAMURA Hideo, KATABUCHI Hidetaka, MURAKAMI Ryuji, YONEMURA Yuji, TASHIRO Hironori, OKUNO Yutaka, IWASE Hirotaka

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be usually used in the lectures. Video lectures or e-learning programs may be considered for those who are regularly absent for unavoidable reasons.
Class objectives	In Lecture Series “Riron”: C6 The Forefront of Clinical Oncology II, you learn basic concepts and novel techniques in the most advanced clinical oncology, including (1) radiation oncology, (2) breast and endocrine oncology, (3) gynecological oncology, (4) neurooncology, (5) hematological oncology.
Goals	You learn basic concepts and novel techniques in the most advanced clinical oncology, including (1) radiation oncology, (2) breast and endocrine oncology, (3) gynecological oncology, (4) neurooncology, (5) hematological oncology.
Class outline	(1) The forefront of radiation oncology, especially the development in 3-D conformal external beam radiotherapy techniques is lectured. (2) The forefront of breast and endocrine oncology is lectured, especially regarding surgery, chemotherapy, and molecular target therapy for breast cancer and thyroid cancer. (3) The forefront of gynecological oncology, especially the recent development and therapeutic modalities, is explained, including brathytherapy, external beam radiotherapy and chemoradiotherapy for uterine cervical cancer. (4) The forefront of neurooncology is explained especially regarding the molecular biology in malignant brain tumors. (5) The forefront of hematological oncology is lectured especially regarding the mechanisms in tumor development and suppression.

Each Summary

No.	Date	Theme	Summary
1	10/11	5th period Natsuo Oya 【eJ-0】	・ “Radiation biology and physics”
2	10/18	6th period Natsuo Oya 【eJ-0】	・ “Stereotactic radiotherapy and intensity-modulated raidotherapy”
3	10/25	5th period Ryuji Murakami 【eJ-0】	・ “Image-guided radiotherapy and adaptive radiotherapy”
4	11/01	5th period Hirotaka Iwase 【eJ-0】	・ “Biological features of breast cancer”
5	11/08	5th period Hirotaka Iwase 【eJ-0】	・ “Paradigm shift in breast cancer treatment”
6	11/15	5th period Hirotaka Iwase 【eJ-0】	・ “Molecular target therapy for breast cancer”
7	11/22	5th period Hidetaka Katabuchi 【eJ-0】	・ “Epidemiology of gynecological malignancies”
8	11/29	5th period Hironori Tashiro 【eJ-0】	・ “Treatment of gynecological malignancies”
9	12/06	5th period Hironori Tashiro 【eJ-0】	・ “Radiation therapy for uterine cervical cancer”
10	12/13	5th period Hideo Nakamura 【eJ-0】	・ “Character of brain tumor”
11	12/20	5th period Hideo Nakamura 【eJ-0】	・ “Brain tumor diagnosis”
12	01/10	5th period Hideo Nakamura 【eJ-0】	・ “Brain tumor therapy”
13	01/17	5th period Naofumi Matsuno	・ “Hematological oncology I - leukocytes”
14	01/24	5th period Yutaka Okuno	・ “Hematological oncology II - lymphocytes”
15	01/31	5th period Yuji Yonemura 【eJ-0】	・ “Hematological oncology III - erythrocytes”

Required Textbooks	Textbooks are not specified. Handouts may be distributed by instructors.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, or the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100.Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20160)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Restorative Medicine()	★IHN Hironobu, Kamohara Hidenobu, Mizuta Hiroshi, Haga Yoshio, Takahashi Takeshi, Ide Jiyunji, Nakamura Eiichi, Kawano Hiroaki, Okamoto Ken

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	The objectives of this course are for you to understand the following: (1) basic knowledge regarding emergency medical care; (2) factors required to improve the resuscitation rate, the mechanisms by which irreversible loss of whole-brain function occurs, and risk factors for coronary syndrome; (3) the latest knowledge regarding cardiovascular diseases and their surgical treatment; (4) the mechanisms of skin wound healing, differences in body surface blood flow distribution between anatomical locations, and plastic surgery procedures and regenerative medical techniques; (5) disorders of bone and joint function and the reconstruction thereof; (6) basic knowledge required to plan out and implement clinical studies.
Goals	It is recommended for you to review the handout materials distributed in the lectures and your notebooks well. If you want to ask any questions to the lecturers, "Office Hour" is available for you. It is also recommended to review the lectures by using e-learning contents if available.
Class outline	In this class, the current situation and problems of restorative medicine are explained in terms of both life support and vital function. With continued progress in the field of medicine, critical care medicine has produced a steady flow of successful results and its functional prognosis has also improved dramatically. We will explain the basics of emergency and intensive medical care, and in order to contribute the international guideline for the resuscitation techniques and also further improvement of the rate ROSC (return of spontaneous circulation), we will provide lectures regard to the basics of understanding risks for cerebral ischemia during resuscitation, as well as the processes by which induces brain death and results in death even when the heartbeat is restarted to scientifically examine the methods of prevention. Moreover, we will provide lectures regarding risk factors for acute coronary syndrome, which needs urgent therapy, and the progress of surgical treatments for heart failure, ischemic heart diseases, and valvular heart diseases. Although disorders of the skin, bones, and joints are rarely directly life-threatening conditions, they greatly affect a patient's vital functions. We will explain the theory of skin wound healing and the latest molecular biological knowledge, and we will also provide lectures regarding the progress made in the area of skin flaps through studies of blood flow in human skin and discuss reconstructive medicine for the blood vessels, lymph vessels, and nerves in terms of the development of microsurgery.

Each Summary

No.	Date	Theme	Summary
1	10/12	4th period Hironobu Ihn 【eE-0】	Wound healing
2	10/19	4th period Hironobu Ihn 【eJ-0】	Flap
3	10/26	4th period Hironobu Ihn 【eJ-0】	Microsurgery
4	11/02	4th period Junji Ide 【eJ-0】	Joint reconstruction
5	11/09	4th period Hiroshi Mizuta 【eJ-0】	Repair and regeneration of articular cartilage
6	11/16	4th period Eiichi Nakamura 【eJ-0】	Reconstruction of bone
7	11/30	4th period Takeshi Takahashi 【eJ-0】	Clinical Research in Emergency and Critical Care Medicine
8	12/07	4th period Kamohara Hidenobu 【eJ-0】	Important factors in the success for resuscitation
9	12/14	4th period Kamohara Hidenobu 【eJ-0】	Diagnosis of brain death and the denervated organs
10	12/21	4th period Hiroaki Kawano 【eJ-0】	Risk factors for acute coronary syndrome and gender difference
11	01/11	4th period Okamoto Ken 【eJ-0】	Sugical treatment of heart failure
12	01/18	4th period Okamoto Ken 【eJ-0】	Surgical treatment of ischemic heart disease
13	01/25	4th period Okamoto Ken 【eE-0】	Surgery of valvular heart disease
14	02/01	4th period Yoshio Haga 【eJ-0,eE-0】	Establishment of hypothesis and study design
15	02/08	4th period Yoshio Haga 【eJ-0,eE-0】	How to analyze clinical data

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers as well as participation in class discussions.
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20170)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Cancer therapeutics(Cancer therapeutics)	BABA Hideo, Suzuki Makoto, In Hironobu, INOMATA Yukihiro, OYA Natsuo, SASAKI Yutaka, MITSUYA Hiroaki, MIZUTA Hiroshi, Kourogi Hirotsugu, KATABUCHI Hidetaka, NAKAYAMA Hideki, IWASE Hirotaka, MINODA Ryosei, KAWANO Yoshiaki, NAKAMURA Hideo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	With the lecture pattern that attached great importance to questions and answers [the form of the class], we utilize power point,OHP. In addition, we deal with a student and the member of society student of the distant place by supplementary lecture, intensive lecture, video lecture or e-learning.
Class objectives	In the current lecture, we lead to comprehend the fundamental knowledge of therapy for cancer such as surgery, radiotherapy, chemotherapy and immunotherapy and the historical change, standard treatment and future directions of cancer therapy. Furthermore, the aims of the current lecture are to understand thoroughly the leading-edge medical treatment for various types of cancer as follows: (1) gastroenterological tumor (2) respiratory tract tumor (3) brain and nervous system neoplasm (4) head and neck tumor (5) otolarygological neoplasia (6) breast endocrine tumor (7) genitourinary system tumor (8) gynecological tumor (9) orthopaedic and neuro-musculoskeletal tumor (10) skin tumor (11) hematopoietic tumor (12) pediatric tumors.
Goals	To comprehend the fundamental knowledge of therapy for cancer such as surgery, radiotherapy, chemotherapy and immunotherapy and the historical change, standard treatment and future directions of cancer therapy. To understand thoroughly the leading-edge medical treatment for various types of cancer as follows: (1) gastroenterological tumor (2) respiratory tract tumor (3) brain and nervous system neoplasm (4) head and neck tumor (5) otolarygological neoplasia (6) breast endocrine tumor (7) genitourinary system tumor (8) gynecological tumor (9) orthopaedic and neuro-musculoskeletal tumor (10) skin tumor (11) hematopoietic tumor (12) pediatric tumors.
Class outline	The aims of current lecture are to understand the up-to date treatment for the various types of cancer in addition to standard cancer therapy such as surgery, radiotherapy, chemotherapy and immunotherapy. In late years a guideline is devised every each organ, and maintain the balance of therapy is planned about the cancer.A number of clinical trials are promoted to attempt the standardization of the cancer therapy. You can learn how the standard treatments are confirmed from the results of various clinical trials.

Each Summary

No.	Date	Theme	Summary
1	02/06	(Mon)5th period Yutaka Sasaki 【eJ-0】	Medical treatment of the gastrointestinal cancer
2	02/13	(Thu) 5th period Hideo Baba 【eJ-0】	Surgical cure of the digestive cancer
3	02/16	(Mon)5th period Hirotsugu Kohrogi 【eJ-0】	Medical treatment of the lung cancer
4	02/17	(Fri) 6th period Makoto Suzuki 【eJ-0】	Surgical treatment of the lung cancer
5	02/20	(Mon)5th period Hideki Nakayama 【eJ-0】	The treatment of the Oral cancer The lecture will be performed on the effectiveness and clinical application of surgery, radiotherapy, chemotherapy, and immunotherapy in oral cancer patients.
6	02/23	(Thu) 5th period Ryosei Minoda 【eJ-0】	The treatment of the head and neck cancer
7	02/27	(Mon)5th period Hiroshi Mizuta 【eJ-0】	The treatment of the bone soft part tumor
8	03/02	(Thu) 5th period Hirotaka Iwase 【eJ-0】	Treatment of breast cancer
9	03/06	(Mon)5th period Hidetaka Katabuchi 【eJ-0】	The treatment of the gynecologic malignant tumor
10	03/09	(Thu) 5th period Yoshiaki Kawano 【eJ-0】	The treatment of genitourinary cancers
11	03/13	(Mon)5th period Hironobu Ihn 【eJ-0】	Skin cancer therapy___
12	03/16	(Thu) 5th period Yukihiro Inomata 【eJ-0】	Pediatric Solid Cancer Therapy
13	03/23	(Mon)5th period Hideo Nakamura 【eJ-0】	The treatment of the brain tumor
14	03/27	(Thu) 5th period Yutaka Okuno 【eJ-0】	The treatment of the hematopoietic tumor
15	03/30	(Thu) 5th period Natsuo Oya 【eJ-0】	Radiotherapy of the cancer

Required Textbooks	We distribute in particular the print which we summarized the point of the lecture in without appointing it.
Reading list	・ A new clinical oncology ・ Cancer principles & practice of oncology,V.T. DeVita, S.Hellman, S.A.Rosenberg,Lippincott Willams &Wilkins ・ Clinical Oncology, M.D.Abeloff, J.O. Armitage, J.E.Niederhuber,M.B.Kastan,W.G.McKenna, Elsevier ・ Cancer Medicine, Holland-Frei, AACR ・ The biology of Cancer, R.A.Weinberg, Garland Science ・ NCCN guideline
Information concerning enrollment	
Assessment methods and criteria/ratios	We evaluate the attendance situation to a lecture, lecturing questions and answers and the lecture understanding degree about the matter which we raised to the [the aim of the class] by reports about a theme shown at being finished.Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100.Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions.
Language of instruction	lecture in Japanese + Japanese textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20180)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Paliative Care()	Yamamoto Tatsuo

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	Using e-learning system in Web site of Japan Society of Clinical Oncology
Course Goals	Most clinical professionals have been affected by caring for patients with palliative care needs. Such patients may challenge us at both a professional and at a personal level in areas where we feel our confidence or competence are challenged. This course serves as introductory for Palliative care medicine.
Course Achievement Targets	
Outline	In order to understand the principle of palliative care medicine, we discussed the followings: (1) oncology, (2) symptom management, (3) emotional issues in palliative medicine, (4) culture and spiritual aspects of palliative medicine, (5) contribution of palliative medicine of allied health professions.

Details for Individual Classes			
No.	Date	Theme of Course	Brief Outline of Course
1			

Textbooks/Materials	not specified
Reading List	Oxford Textbook of Paliative medicine. 3rd. Edited by Doyle D, Hanks G, et al., Oxford University Press Oxford Handbook of Palliative care. Edited by Watson M, Lucas C, Hoy A, Back I, Oxford University Press
Enrollment Prerequisites	
Assessment Methods and Criteria	
Language of Instruction	Instruction in Japanese + Japanese Textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20190)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
The Theory of Clinical Research()	Iwase Hirotaka, Kadooka Yasuhiro, Usuku Koichiro, Saitou Hideyuki, Hamada Akinobu, Tamura Kenji, Suzuki Makoto, Baba Hideo,

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be usually used in the lectures. Video lectures or e-learning programs may be considered for those who are regularly absent for unavoidable reasons.
Class objectives	In Lecture Series, C10 The Theory of Clinical Research, you learn the theory of the clinical research that assumed bioethics a background systematically and learn treatment to be based on a characteristic of the biology, as evidence based medicine, especially in hematological malignancies, gastric cancer, liver cancer, lung cancer and breast cancer. Furthermore, you learn the basics for new treatments based on clinical translational researches, the development of new drugs based on the data of clinical trials, pharmacokinetics and those ethics.
Goals	To comprehend the fundamental knowledge of clinica trials concerning Bioethics for clinical research, Epidemiological background of clinical trials, Personalized chemotherapy, Pharmacokinetics/Pharmacodynamics of anti-tumor agents, Tanslational research, Clinical trials on lung cancer, Clinical trials on gastric colorectal and hepatic cancer, and Clinical trials on breast cancer.
Class outline	These lectures consist as follows; 1) Bioethics; the clinical research that assumed bioethics a background for the history of the study theory, a problem of the ethical issues specialized in the methodology of the clinical study, a study participant needing special consideration, the ethic guideline attentive reading of the clinical study, consideration about the social responsibility of the researcher. 2) You learn basically, epidemiological background of clinical trials, design of clinical trials, personalized chemotherapy based on pharmacogenomics information, and personalized therapy based on tumor biology. 3) You learn about the biochemical characters and the treatments based on evidence of the clinical trials (EBM; evidence based medicine) in various kinds of cancers, such as hematological malignancies, lung cancer, gastric cancer, colorectal cancer, liver cancer, and breast cancer. In addition, the latest topics of the translational study and prospects of the molecular biology will be discussed.

Each Summary

No.	Date	Theme	Summary
1	10/17	5th period, Kadooka Yasuhiro, eJ-O	History of bioethics for clinical research
2	10/24	5th period, Kadooka Yasuhiro, eJ-O	Details of bioethical guideline for clinical trials
3	10/31	5th period, Kadooka Yasuhiro, eJ-O	Topics of bioethics for clinical research
4	11/07	5th period, Usuku Koichiro, eJ-O, eE-O	Epidemiological background of clinical trials
5	11/14	5th period, Hideyuki Saito, eJ-O	Personalized chemotherapy based on pharmacogenomics information
6	11/21	5th period, Akinobu Hamada, eEJ-L	Pharmacokinetics/Pharmacodynamics of anti- tumor agents
7	11/28	5th period, Kenji Tamura, eEJ-O	Pharmacokinetics/Pharmacodynamics of anti- tumor agents
8	12/05	5th period, Hirotaka Iwase, eEJ-O	Design and Assessment of clinical trailas
9	12/12	5th period, Makoto Suzuki, eE-O	Clinical trials on lung cancer (1)
10	12/19	5th period, Makoto Suzuki, eE-O	Clinical trials on lung cancer (2)
11	12/26	5th period, Hideo Baba, eE-O	Clinical trials on gastric cancer
12	01/16	5th period, Hideo Baba, eE-O	Clinical trials on colorectal cancer
13	01/23	5th period, Hideo Baba, eE-O	Clinical trials on hepatic cell carcinoma
14	01/30	5th period, Hirotaka Iwase, eEJ-O	Clinical Trials on breast cancer (1)
15	01/30	6th period, Hirotaka Iwase, eEJ-O	Clinical Trials on breast cancer (2)

Required Textbooks	Cheson BD,et al. Revised recommendations of the International Working Group for Diagnosis, Standardization of Response Criteria, Treatment Outcomes, and Reporting Standards for Therapeutic Trials in Acute Myeloid Leukemia. J Clin Oncol. 2003 Dec 15;21(24):4642-9.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	We evaluate the attendance situation to a lecture, lecturing questions and answers and the lecture understanding degree about the matter which we raised to the [the aim of the class] by reports about a theme shown at being finished. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions.
Language of instruction	lecture in Japanese + Japanese textbook

Academic Year 2016, D1 Medical & Life Science Seminar

●Place: Lecture room 2,
Medical Education & Library Building 3F.
●Time & Date: From 17:30 (Usually on Wednesday)

No	Schedule	Talker	Title	Affiliation	Inviter
1.	April 22nd (FRI) 17:00~	Ichiro KURANE	Dengue fever and dengue hemorrhagic fever: understanding of the pathogenesis and protective mechanisms	Director, National Institute of Infectious Diseases	AIDS Research Ⅰ
2.	May 11th (WED)	Akiko HAYASHI	Visualization of the morphology of spine and its application for innovative drug development	Professor, Institute of Molecular and Cellular Regulation, Gunma University	Molecular Physiology
3.	May 25th (WED)	Masahiko NISHIYAMA	Cancer treatment and care: The path towards further progress	Professor, Gunma University Graduate School of Medicine, Department of Molecular Pharmacology & Oncology	Obstetrics & Gynecology
4.	June 1st (WED)	Michisuke YUZAKI	Emerging roles of the C1q complement family: link between the brain and immune system	Professor, Department of Physiology, Keio University School of Medicine	AIDS Research Ⅲ
5.	June 15th (WED)	Tsukasa SEYA	Development of priming adjuvant for vaccine immunotherapy	Professor, Graduate School of Medicine, Hokkaido University	Immunology
6.	July 22nd (FRI) 18:30～	Itoshi NIKAIDO	Single-cell transcriptome analysis for realization of effective regenerative medicine	Unit Leader, Bioinformatics Research Unit, RIKEN Advanced Center for Computing and Communication	IRCMS－Ⅰ
7.	September 7th (WED)	Nobuhiko YAMAMOTO	Activity-dependent neuronal circuit formation in the developing cortex	Professor, Osaka University, Graduate School of Frontier Biosciences	Sensory & Cognitive Physiology
8.	October	Takehiko OGAWA	*In vitro* spermatogenesis	Professor, Laboratory of Proteomics, Institute of Molecular Medicine and Life Science, Yokohama City University Association of Medical Science	Pathology & Experimental Medicine
9.	November 9th (WED)	Keizo TOMONAGA	Bornavirus: a new direction of RNA virus research	Professor, Department of Viral Oncology, Institute for Virus Research, Kyoto University	Microbiology
10.	November	Teizo YOSHIMURA	The role of chemoattractants in inflammation and cancer	Associate Professor, Department of Pathology & Experimental Medicine, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama University	Cell Pathology
11.	January 20th (FRI)	Toshiya MURAI	Social cognition in neuropsychiatric disorders	Professor, Kyoto University, Graduate School of Medicine	Neuropsychiatry
12.	Preparing	Tetsuo NODA	Present and future perspective of cancer research.	Cancer Institute, Director	Gastroenterological Surgery
13.	Preparing	Kenshi HAYASHIDA	Basic knowledge of biostatistics for clinical research	The Chemo-Sero-Therapeutic Research Institute, Clinical Development Department, Development Coordination Division, Managing Specialist (Biostatistician)	

Note: The date, time or place of these lectures may change due to the inviter's and lecturer's schedules. Please check the details with the seminar guide leaflet distributed to each Department beforehand. Also please check our website for the latest information. We might add the seminar other than the above.
(http://www.medphas.kumamoto-u.ac.jp/medgrad/keijiban/seminar.html)

D2 Learning from Experienced Doctors Seminar (Elective 2 credits) **Subject code 20230**

Academic Year 2016, D2 Learning from Experienced Doctors Seminar

●Place: Lecture room 2,
Medical Education & Library Building 3F.
●Time & Date: From 17:30 (Usually on Wednesday)

No	Schedule	Talker	Title	Affiliation	Inviter
1.	May 18th (WED)	Manabu YOSHIMURA	Current trend of Medical Education; from hospital to community	Professor and Chair, Department of Community and General Medicine, Faculty of Medicine University of Miyazaki	AIDS Research Ⅲ
2.	June 29th (WED)	Yuzuru KANAKURA	Diagnosis and treatment of hematopoietic stem cell	Professor, Department of Hematology and Oncology, Osaka University Graduate School of Medicine	Medical Biochemistry
3.	July 1st (FRI)	Hiroyoshi NISHIKAWA	New cancer immunotherapy by controlling regulatory T-cells	Professor, Department of Immunology, Graduate School of Medicine, Nagoya University	Immunogenetics
4.	July 6th (WED)	Yasutoshi KOGA	Development of therapeutics agents for mitochondrial disease	Professor, Department of Pediatrics and Child Health, Kurume University School of Medicine	Molecular Physiology
5.	July 8th (FRI)	Hiroaki KAZUI	Current state of diagnosis and treatment for idiopathic normal pressure hydrocephalus	Assistant Professor, Department of Psychiatry, Osaka University Graduate School of Medicine	Neuropsychiatry
6.	September	Naoyuki MATSUDA	Pathophysiology and Therapeutic Regulation in Severe Sepsis and Septic Shock	Professor, Emergency & Critical Care Medicine, Nagoya University graduate School of Medicine	General Medicine
7.	December 6th (TUE) 17:30～	Kazutoshi MORI	Dynamics of function and regulation of the endoplasmic reticulum	Professor, Graduate School of Science, Kyoto University	Molecular Genetics
8.	January 11th (WED)	Yoshiki KUDO	Functions of human placental trophoblast: physiology and pathology	Professor, Department of Obstetrics and Gynecology, Graduate School of Biomedical Sciences, Hiroshima University	Obstetrics & Gynecology
9.	February 8th (WED)	Kiyoko KATO	Development of Endometrial Cancer Stem-like Cells Target Therapy	Professor, Department of Gynecology and Obstetrics, Graduate School of Medical Sciences, Kyushu University	Obstetrics & Gynecology
10.	Preparing	Yoko KATO	The carrier formation for doctors and international collaboration with the Japanese neurosurgery	Professor, Department of Neurosurgery, Fujita Health University Banbuntane Hotokukai Hospital	Neurosurgery
11.	Preparing	Toshiharu YAMAGUCHI	Treatment strategy for GI cancer in a high volume cancer center.	Cancer Institute Hospital, Hospital Director	Gastroenterological Surgery

Note: The date, time or place of these lectures may change due to the inviter's and lecturer's schedules. Please check the details with the seminar guide leaflet distributed to each Department beforehand. Also please check our website for the latest information. We might add the seminar other than the above.

(http://www.medphas.kumamoto-u.ac.jp/medgrad/keijiban/seminar.html)

*** Each seminar will be held in Japanese. ***

A report format of "D1: Medical and Life Science Seminar"

Write 2 essays based on 2 talks chosen from the seminar "D1: Medical and Life Science Seminar". Length of the essays should be 250-500 words. "D1 :"Medical and Life Science Seminar" requires students to attend more than 15 lectures for credit before completion of their Thesis research. Send each essay to the supervisor (inviter of the talker) of the talk within one month by E-mail (not by hard copy or any other digital media). The file of the essay should be included in the E-mail both in an attached file and in the text. A carbon copy E-mail should be also sent to Medical Faculty Educational Affairs Planning Section (iyg-igaku@jimu.kumamoto-u.ac.jp). Attendance will be taken in every talk by signing your name at the entrance of the lecture room.

Graduate schools of medicine, Medical Course , (Doctor) D1"Medical and Life Science Seminar" Report

Student : Grade	Registered number	Division	Name
Title of talk:			
Talker:			
Date:			
Place:			
A body of essay: Fill this A4 sheet with 250-500 words			

A report format of "D2: Learning from Experienced Doctors Seminar"

Write 2 essays based on 2 talks chosen from the seminar "D2: Learning from Experienced Doctors Seminar". Length of the essays should be 250-500 words. "D2: Learning from Experienced Doctors Seminar" requires students to attend more than 15 lectures for credit before completion of their Thesis research. Send each essay to the supervisor (inviter of the talker) of the talk within one month by E-mail (not by hard copy or any other digital media). The file of the essay should be included in the E-mail both in an attached file and in the text. A carbon copy E-mail should be also sent to Medical Faculty Educational Affairs Planning Section (iyg-igaku@jimu.kumamoto-u.ac.jp). Attendance will be taken in every talk by signing your name at the entrance of the lecture room

Graduate schools of medicine, Medical Course, (Doctor) D2 "Learning from Experienced Doctors Seminar" Report

Student : Grade	Registered number	Division	Name
Title of talk:			
Talker:			
Date:			
Place:			
A body of essay: Fill this A4 sheet with 250-500 words			

Approval of Credits of Elective Subject in Doctoral Course, D3 Medicine and Life Science Training (Subject code 22220)

1. In the wake of realization of doctoral course lessons in the graduate school, presentations at academic meetings, such as academic conferences and lecture meetings, under the sponsorship of academic societies and universities, but not under the sponsorship of private organizations will be approved as credits.

2. “D3 Medicine and Life Science Training” is an elective subject in the doctoral course and up to a maximum of 2 credits can be awarded from presentations at academic conferences. (Refer to the list of lecture course/subject and credit in the syllabus.)

3. The criteria for credit approval are stipulated below. In addition, academic meetings that meet the above criteria such as academic conferences, lecture meetings and symposiums, will be judged by the committee of the postgraduate education.

1) In international academic meetings such as conferences, meetings, and symposiums, which are held domestically and abroad, or in national conferences and study meetings, which are held domestically, attendance as a leading presenter of a poster or an oral presentation as the first author of the abstract will be approved for a maximum of 2 credits.

2) In local academic meetings, such as conferences, lecture meetings and seminars, leading a poster or oral presentation as the first author of the abstract will be approved for a maximum of 1 credit.

For relation of the term of academic meetings and the number of credits to be approved, refer to the detailed regulations as shown in the next page.

4. How to apply for credits and the process of approving credits (The stipulations of this matter and the necessary forms are published on the website for the Graduate School of Medical Sciences and can be downloaded from the website).

1) Graduate students should record and submit the necessary information. Record in the prescribed application form (Refer to Format 1) the names of academic meetings, the term of the meetings and reports. Submit the written form to the Educational Affairs Planning Section (Ext. 5029) with 1) a certificate of participation (a copy is acceptable), 2) a copy of the program in which the presentation is published in and 3) a copy of the abstract that the student has published as a leading presenter. In principle, submit the forms within the same academic year as conference participation. The application form will be examined by the committee of the postgraduate education (generally held on every third Wednesday).

2) The committee of the postgraduate education will review all submissions and calculate credit based on the detailed regulations (Attachment 1). The credits will be calculated, and when they reach 2 or more, they will be given to SOSEKI by the Educational Affairs Planning Section. Students need to view SOSEKI to check their acquired credits. If the number of credits doesn’t reach 2, it will not be approved (0 credits).

The Detailed Regulations for Approving the Number of Credits in D3 Medicine and Life Science Training

In a faculty meeting on May 28, 2008, it was approved that beginning from the academic year of 2009, students can acquire up to a maximum of 2 credits as D3 Medicine and Life Science Training (which is an elective subject in the doctoral course) by participating in academic meetings as a leading presenter. The detailed regulations of credit approval are stipulated below.

1. Presentations at academic meetings given in 2008 by students who entered in the academic year of 2008 can be approved for credit. However, the application form and the documents that show proof of the students' presentations must be submitted within the 2008 academic year.

2. The relation between the term of academic meetings and the number of credits to be approved is based on the following criteria.

1) The maximum credits will be given for participation in three (3) day academic meetings. "Riron" lecture-style classes, are lecture courses in a subject that consist of fifteen (15) 90-minute sessions (32.5 hours in total). These are worth 2 credits. Academic meetings are generally held from 8 a.m. to 6 p.m. It can be considered that three days participation in academic meetings is equivalent to about thirty (30) hours of study in a regular class.

2) An academic meeting, which is held for half a day should be counted one sixth (1/6) of one credit. For example, one third (1/3) of the stipulated maximum credits should be given by an academic meeting held for one (1) day, a half (1/2) for one and a half (1 1/2) days and two thirds (2/3) for two (2) days.

3) Specific examples of calculating credits:
When a student gives a presentation as the leading presenter at international meetings or domestic national academic meetings held for three days or more, 2 credits should be given. When meetings are held for one day, two thirds (2/3) of one credit will be given, when they are held for one and a half days, one (1) credit should be given, and when they are held for two days, four thirds (4/3) should be given.

When a student gives a presentation as the leading presenter at local academic meetings held for two days, two thirds (2/3) of one credit should be given, when meetings are held for one day, one third (1/3) of one credit should be given and when they are held for half a day, one sixth (1/6) of one credit should be given.

3. When the number of days a student participate in does not match the stipulations above, credits to be awarded will be decided, after deliberations, by the committee of the postgraduate education.

(Format 1)

Application Form for Credits of
D3 Medicine and Life Science Training: (Presentations at academic meetings)

Application date: (year/month/day)

Name:	___ Year	Student number:	Affiliation :
Course name (if applicable): Phone number: E-mail address:			
Name of academic meeting:			
Date of meeting (y/m/d): ～		City and venue of meeting:	
Date when the applicant participated in the meeting(y/m/d): ～ (_____ days)			
Presenters' names (all):			
Title of the presentation: (circle one) oral poster			
The number of credits to be applied for approval (Refer to the detailed regulations in Attachment 1 about how to calculate): _____ credits			
Report about what you have learned through participating in the academic meeting (Write 200 words or more below.)			

Submit 1) a certificate of participation in the academic meeting (a copy is acceptable), 2) a copy of the program in which the presentation is published in, 3) a copy of the abstract that the student has published as a leading presenter in written form together with this application form to Student Affairs Section (5029). (Screening for approval of credits will be conducted in the committee of the postgraduate education, which is held on every third Wednesday.)

Academic Year 2016, D4 Translational Research Seminar

●Place : Lecture room 2, Medical Education & Library Building 3F.
●Note : The date, time or place of these lectures may change due to the instructor's and lecturer's schedules.
Please check our website for the latest information.

No	Schedule	Talker	Title	Affiliation	Inviter
1.	April 22nd (FRI) 17:00~	Ichiro KURANE	Dengue fever and dengue hemorrhagic fever: understanding of the pathogenesis and protective mechanisms	Director, National Institute of Infectious Diseases	AIDS Research Ⅰ
2.	May 11th (WED)	Akiko HAYASHI	Visualization of the morphology of spine and its application for innovative drug development	Professor, Institute of Molecular and Cellular Regulation, Gunma University	Molecular Physiology
3.	May 25th (WED)	Masahiko NISHIYAMA	Cancer treatment and care: The path towards further progress	Professor, Gunma University Graduate School of Medicine, Department of Molecular Pharmacology & Oncology	Obstetrics & Gynecology
4.	July 1st (FRI)	Hiroyoshi NISHIKAWA	New cancer immunotherapy by controlling regulatory T-cells	Professor, Department of Immunology, Graduate School of Medicine, Nagoya University	Immunogenetics
5.	July 6th (WED)	Yasutoshi KOGA	Development of therapeutics agents for mitochondrial disease	Professor, Department of Pediatrics and Child Health, Kurume University School of Medicine	Molecular Physiology
6.	February 8th (WED)	Kiyoko KATO	Development of Endometrial Cancer Stem-like Cells Target Therapy	Professor, Department of Gynecology and Obstetrics, Graduate School of Medical Sciences, Kyushu University	Obstetrics & Gynecology
7.	Preparing	Tetsuo NODA	Present and future perspective of cancer research.	Cancer Institute, Director	Gastroenterological Surgery
8.	Preparing	Kenshi HAYASHIDA	Basic knowledge of biostatistics for clinical research	The Chemo-Sero-Therapeutic Research Institute, Clinical Development Department, Development Coordination Division, Managing Specialist (Biostatistician)	
9.	Preparing	Toshiharu YAMAGUCHI	Treatment strategy for GI cancer in a high volume cancer center.	Cancer Institute Hospital, Hospital Director	Gastroenterological Surgery

A report format of “D4: Translational Research Seminar”

This course, offered from 2014, is the subject using the selected 5 seminars of "D2 Learning from Experienced Doctors Seminar" and the selected seminars of " HIGO Business Seminar Series."

Write 1 essay based on 1 talk chosen from the seminar “D4: Translational Research Seminar”. Length of the essay should be 250-500 words. “D4: Translational Research Seminar” requires students to attend more than 8 lectures for credit before completion of their Thesis research. Send the essay to Medical Faculty Educational Affairs Planning Section within one month by E-mail (not by hard copy or any other digital media). The file of the essay should be included in the E-mail both in an attached file and in the text. (iyg-igaku@jimu.kumamoto-u.ac.jp). Attendance will be taken in every talk by signing your name at the entrance of the lecture room

Graduate schools of medicine, Medical Course, (Doctor) D4” Translational Research Seminar”Report

Student：Grade　Registered number　Division　Name
Title of talk:
Talker:
Date:
Place:
A body of essay:　Fill this A4 sheet with 250-500 words

9. Course Work subject

(Medical Experiment Course)

Subject code : ２０２００

Academic Year 2016 Graduate School's Medical Experiment Course

Location : Lecture Room 2(Medical Education & Library Building 3F)

Date	AM		PM	
April 5 (Tue.)	8:45 ～ 10:15	Introduction to recombinant DNA technique (Molecular Genetics : Kazutoyo Terada)	13:15 ～ 14:45	Principle and application of polymerase chain reaction (Medical Biochemistry : Sato Yoshifumi)
	10:30 ～ 12:00	Gene Trasfer Technique (Molecular Physiology : Wei fanyan)	15:00 ～ 16:30	Research Integrity (Bioethics : Yasuhiro Kadooka)
April 6 (Wed.)	8:45 ～ 10:15	Cell imaging and quantitative analysis (Medical Cell Biology : Noriko Saitoh)	13:15 ～ 14:45	Protein Purification (General Methods) (Molecular Cell Biology : Masatoshi Esaki)
	10:30 ～ 12:00	Basic science and clinical research for molecular imaging (Pathology and Experimental Medicine: Koki Hasegawa)	15:00 ～ 16:30	Protein for labile molecule handling －An example:Purification of a protease (Molecular Pathology : Takahisa Imamura)
April 7 (Thu.)	8:45 ～ 10:15	Methods in cell biology (Molecular Pharmacology : Kazuaki Umeda)	13:15 ～ 14:45	Analytical methods for intracellular signaling (Hematopoiesis : Shinya Suzu)
	10:30 ～ 12:00	Experiment study and safety control (Environmental Safety Center: Yoshihiro Yamaguchi)	15:00 ～ 16:30	Introduction to flowcytometry (Department of Immunology and Hematology, School of Health Sciences : Seiji Inui)
April 8 (Fri.)	8:45 ～ 10:15	Pharmacokinetics (Clinical Pharmaceutical Sciences : Hideyuki Saito)	13:15 ～ 14:45	Production of polyclonal and monoclonal antibodies (Germline Development : Akira Nakamura)
	10:30 ～ 12:00	Basic Methods in Immunology (Immunogenetics : Satoru Senju)	15:00 ～ 16:30	In situ hybridization (Developmental Neurobiology : Kunimasa Ota)
April 11 (Mon.)	8:45 ～ 10:15	Experimental animals and animal Experimentations Ⅰ (Division of Microbiology and Genetics: Daisuke Torigoe)	13:15 ～ 14:45	Reproductive Engineering Techniques (Reproductive Engineering: Naomi Nakagata)
	10:30 ～ 12:00	Experimental animals and animal Experimentations Ⅱ (Division of Microbiology and Genetics : Daisuke Torigoe)	15:00 ～ 16:30	Proteomics (Tumor Genetics and Biology : Norie Araki)
April 12 (Tue.)	8:45 ～ 10:15	Practice and Guidance for Biological Laboratory Safety (Medical Virology: Yosuke Maeda)	13:15 ～ 14:45	Guidance for Living Modified Organism (LMO) (Division of Bioinformatics : Masatake Araki)
	10:30 ～ 12:00	Immunohistochemistry (Cell Pathology : Yoshihiro Komohara)	15:00 ～ 16:30	Methods for Literature Search (Lecture Room: The 3rd floor of General Medical Research Building) (Medical Information Science : Koichiro Usuku)

※The lectures will be given in Japanese.

10. Departmental Course “Practice(jissen)” I,II

Medical Sciences

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20380)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
"Research Conducting Program ""Practice"" I : Anatomy()	Fukuda Takaichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	lecture, discussion
Class objectives	This course aims to instruct students for acquiring essential knowledge about the morphology of central neurons and also about the experimental techniques such as light microscopy, confocal laser scanning microscopy, unbiased quantitative analysis.
Goals	Students can explain the detailed morphological features of neurons in the central nervous system and the essential techniques for morphological studies.
Class outline	Every physiological function in vivo requires particular anatomical structures for its execution. Morphological and functional aspects are inseparably related to each other within the body such that morphological approaches still constitute the essential part of the biomedical science. This Department Course focuses on the tissue architecture of the central nervous system, particularly on several critical components of the system such as cytoarchitecture, synapses, neuronal gap junctions, dendrites and spines. Students are instructed for necessary experimental techniques including electron microscopy, confocal laser scanning microscopy, computer-based 3D-reconstruction/analysis of the structure, and unbiased morphometry (stereology), through intensive reading of the representative literatures, lectures, and discussion on the research activities of individual students.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following issues: 1) the ability of critical reading of the representative papers, 2) knowledge on the principles of major morohological techniques and the ability to deduce the appropriate conclusion from the obtained data, 3) the ability to explain the significance of their own study from the historical perspective.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21190)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Anatomy()	Fukuda Takaichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実験
Class method	practical training in the labo
Class objectives	This course aims to instruct students for acquiring the basic and advanced techniques to execute morphological studies on the central nervous system.
Goals	Students can prepare histological specimens of the high quality, examine them using sophisticated morphological techniques such as multi-label fluorescence immunohistochemistry and confocal laser scanning microscopy, execute bias-free quantitative analysis for the image data, then draw reasonable conclusion.
Class outline	Students are instructed for execution of the experiment through the skilled morphological techniques. They learn to prepare high-quality specimens for histology, to operate EM and CLSM with the highest resolution, and to observe and interpret the structure for an in-depth analysis. Obtained results should be presented in scientific meetings and journals.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The following criteria must be satisfied: 1) acquisition of principal experimental skills for morphology, 2) appropriate analysis of the obtained results, 3) publication in high-quality journal(s).

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20280)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Histology()	Wakayama Tomohiko

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tomohiko Wakayama Program Schedule: year 1-4, every Tuesday (7th period) Site and Facilities: seminar rooms and laboratories at Department of Histology
Class objectives	----------
Goals	----------
Class outline	Histology is the study of the tissues of the body for human and experimental animals. Students will learn how these tissues are arranged to constitute organs of their bodies. Spermatogenesis is a complicated process to produce spermatozoa. “Staging” or the cellular association in seminiferous epithelium is required for the evaluation of spermatogenesis. The stages are defined according to morphological criteria. Histochemistry is a valuable method to determine stages in spermatogenesis. Students will learn histochemistry to indicate methods for visualize the expression and cellular localization of a variety of biological molecules in tissue sections. Students will learn several procedures to obtain the information of cellular localization based on enzymatic reactions, lectin reactions, antigen-antibody reactions, or nucleic-acid hybridization. They should also analyze the function of the molecules in spermatogenesis. The results should be published as scientific papers and students will also present their data in some scientific meetings.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed and reports submitted. The evaluation will be done based on the following issues. 1) The ability to read the representative literatures related in the research theme. 2) The knowledge on the principles and skills of histochemical techniques. 3) The ability to analyze the obtained data. 4) The ability to explain their research theme.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21090)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Histology()	Wakayama Tomohiko

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tomohiko Wakayama Program Schedule: year 1-4, every Thursday (7th periods) Site and Facilities: seminar rooms and laboratories at Department of Histology
Class objectives	
Goals	
Class outline	Students will acquire histochemical techniques to analyze functional molecules in spermatogenesis. They will learn to prepare and observe tissue specimens for histochemistry in light and electron microscopy. They should present obtained results in scientific meeting and journals.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed and reports submitted. Evaluation will be done based on the following criteria. 1) Acquisition of histochemical techniques to analyze the expression and cellular localization of a variety of functional molecules in spermatogenesis. 2) Research progression based on the data obtained by experiments. 3) Publication in high-quality journal(s).

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20400)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Morphological Neural Science(Adult Neurogenesis)	TAMAMAKI Nobuaki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Experiment and discussion.
Class objectives	Present research data in an international meeting that relating to Neuroscience, and collect other researchers opinion. Then, we will prepare article paper to publish it in a proper journal.
Goals	Establish how to induce adult neurogenesis in the neocortex and recover brain function by transplanting neuron progenitors.
Class outline	It is well known that a significant number of neurons are continuously produced in the two sites of the adult mammalian brain, the hippocampal dentate gyrus and the subventricular zone of the telencephalon. The dentate gyrus produces new granule cells to code new descriptive memory every day. The subventricular zone of the telencephalon produces new GABAergic neurons as a response to the turn-over of the olfactory receptor cells in the nasal epithelium. Therefore, the adult neurogenesis might be the phenomena generally induced by the stress added on the neuron progenitors. As the results of aging, accidents, and other factors, brain suffers from hemorrhage, ischemia, epilepsy, amyloid deposition, virus infection and physical damages. There pathological damage may be stress to the neocortical neuron progenitors hidden somewhere inside the cranium.
Required Textbooks	
Reading list	
Information concerning enrollment	Need visit professor office.
Assessment methods and criteria/ratios	Assessment will base on the seminar presentation of their own research results.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21210)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Morphological Neural Science(Growth factor for Neuron progenitors)	TAMAMAKI Nobuaki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Experiment and discussion
Class objectives	Present research data in an international meeting that relating to Neuroscience, and collect other researchers opinion. Then, we will prepare article paper to publish it in a proper journal.
Goals	We will establish which growth factors stimulate which type of neuron progenitors in the neocortex. We will also find out the location of the neuron progenitors.
Class outline	The ratio of the excitatory neurons and the inhibitory neurons must be stable all the time. Otherwise, brain circuit will suffer from epilepsy or depress because of to many excitatory neurons or inhibitory neurons. In order to prepare proper number of neurons in the adult brain, adult brain must prepare neuron progenitor at the same time.
Required Textbooks	
Reading list	
Information concerning enrollment	Need visit professor office.
Assessment methods and criteria/ratios	Assessment will base on the seminar presentation of their own research results.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20270)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Developmental Neurobiology()	Ohta Kunimasa

Goals with their ratio
Under　construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be used in the lecture
Class objectives	The goal of this lecture is to assist students to learn the molecular mechanism of axon guidance and neural stem cell maintenance.
Goals	Classes on the developmental neurobiology cover topics including not only the axonal circuit formation but also the regulation of neural stem cells, the development of cerebral cortex, clinical neurological diseases including Parkinson's disease, Alzheimer's disease, and hydrocephalus.
Class outline	For the axon guidance, the lecture will introduce the molecular mechanism of the neuron circuit formation between retinal ganglion cells to the eye field in the brain, commissure axons to floor plate in the spinal cord, the motor axons to muscle in the leg.
Required Textbooks	No textbook is specified but handouts summarizing the lecture will be provided.
Reading list	Kandel et al., Principles of Neural Sciences, Fifth Edition, 2012
Information concerning enrollment	Should have basic knowledge for biology.
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the report related to the topics in each class.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
21080	2016whole year	Graduate School of Medical Sciences(21080)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Developmental Neurobiology()	Ohta Kunimasa

Goals with their ratio
Under　construction ・・・・100%

Teaching Style	実習及び実技
Class method	PowerPoint will be used in the lecture
Class objectives	The goal of this lecture is to learn the electroporation method using chick and mouse.
Goals	Students will learn the electroporation methods and be able to perform it. They will notice how the important molecules functions during the development, specifically in the nervous system.
Class outline	To examine the molecular function of your target molecules, the gain-of function and loss-of-function technique is very effective. This lecture will introduce the electroporation method using chick and mouse embryos.
Required Textbooks	No textbook is specified.
Reading list	Developmental Biology by Scott Gilbert
Information concerning enrollment	Should have basic knowledge for biology.
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the report related to the topics in each class.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20390)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Sensory and Cognitive Physiology()	Song Wen-Jie, Takemoto Makoto, Nishimura Masataka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and tutorial
Class objectives	Sensory perception is a major brain function, and still remains to be a major research subject of neuroscience. This course will cover the background, give examples, and take students to the forefront of sensory neuroscience research, so to make students theoretically ready to start his/her own research project.
Goals	This course aims to make students theoretically ready to start his/her own project of sensory neuroscience research.
Class outline	We will learn in this class mechanisms of sensory information processing at the molecular, cellular, and system level, through reading research articles that have significantly advanced our understanding of sensory information processing. Meanwhile, methods used for sensory physiology research will be thoroughly discussed. Students are then required to make their own plan of auditory research, using electrophysiological or optical approaches. The supervisors will give advice on the design and execution of experiments, and also on the analyses and publication of research results.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Methods: Students are evaluated based on the course hours completed, their ability in design and execution of research projects as well as in interpretation of research results. Publications of research articles or meeting abstracts and presentations at lab meetings, are also taken into account for evaluation. Criteria: A successful student must 1) be highly motivated in conducting proper design and execution of experiments, and 2) have developed skills in scientific communication, and 3) have obtained novel findings either on neural basis of auditory perception, or on neuronal mechanisms of acoustic information processing, or on molecular mechanisms of sensory information processing.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21200)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Sensory and Cognitive Physiology()	Song Wen-Jie, Takemoto Makoto, Nishimura Masataka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Hands on demonstrations and tutorials
Class objectives	This course aims to train students to master at least one of the major techniques that is currently required for sensory neuroscience research.
Goals	Students are required in this course to master 1) techniques for preparing cell/animal models for research, and 2) patch clamp recording at all configurations for investigation of ion channels and receptors, or in vivo intracellular and extracellular recording techniques for experimental analyses of cellular physiology and neuronal circuit properties, or optical imaging and psychophysical techniques for experiments in auditory perception.
Class outline	The aim of this class is for the students to acquire techniques required for cellular and system neurophysiology. Specifically, students are required to master 1) techniques for preparing acute or chronic animal models for sensory physiology research, and 2) patch clamp recording at all configurations through investigation of ion channels and receptors, or 3) in vivo intracellular and extracellular recording techniques through experimental analyses of cellular physiology and neuronal circuit properties, or 4) optical imaging and psychophysical techniques through experiments in auditory perception.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Methods: Students are evaluated based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’ s presentation and discussion at the laboratory and academic meetings. Criteria: A successful student must 1) have gained the ability of preparing animal models, and 2) have mastered either patch-clamp recording techniques, or intracellular/extracellular recording techniques, or optical imaging techniques, or psychophysical techniques for addressing problems in sensory perception.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20250)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
"Research Conducting Program ""Practice"" I : Molecular Physiology"()	Tomizawa Kazuhito

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Practice with mentor and seminar in the Department of Molecular Physiology
Class objectives	The goal of this course is that students will have the following ability; 1) Proposal of appropriate research projects on the basis of understanding the background on the molecular mechanism on regulation of homeostasis by hormone and central nervous system. 2) Understanding how to investigate molecular mechanism of the regulation of homeostasis. 3) Logical/proper experimental design to clear the mechanism of the regulation of homeostasis. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute not only to better understanding for molecular mechanism on homeostasis but also to successful development of diagnosis, prevention, and treatment of various diseases.
Goals	The achievement will be evaluated according to the following criteria. 1) Proposal of appropriate research projects on the basis of understanding the background on the molecular mechanism on regulation of homeostasis by hormone and central nervous system. 2) Understanding how to investigate molecular mechanism of the regulation of homeostasis. 3) Logical/proper experimental design to clear the mechanism of the regulation of homeostasis. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute not only to better understanding for molecular mechanism on homeostasis but also to successful development of diagnosis, prevention, and treatment of various diseases.
Class outline	The aim of this Departmental Course is to learn how to propose scientific hypothesis for novel molecular mechanisms of the regulation of homeostasis. The hypothesis must then be proven experimentally. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for the acknowledgement of pathophysiology of some diseases and prevention and treatment of the diseases. Specific research projects to be executed should be determined by searching latest literatures related to the molecular physiology. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of physiology, pathophysiology, molecular biology and cell biology. All instructions in these processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	If needed, you will be suitably indicated.
Reading list	
Information concerning enrollment	Should have basic knowledge about physiology.
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for molecular physiology and pathophysiology, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into account for evaluation.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21060)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Physiology()	Tomizawa Kazuhito

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Supervisor: Kazuhito Tomizawa Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Facilities: Seminar room and laboratories at Department of Molecular Physiology
Class objectives	The goal of this course is that students learn the following ability; 1) culture cells and regulate gene and protein functions in cells. 2) experimental skills to isolate pancreatic β cells . 3) experimental techniques to image intracellular signaling such as calcium. 4) experimental techniques for physiological analyses in vivo. 5) experimental skills to investigate signal transduction such as protein phosphorylation.
Goals	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to culture cells and regulate gene and protein functions in cells. 2) Acquisition of experimental skills to isolate pancreatic β cells . 3) Acquisition of experimental techniques to image intracellular signaling such as calcium. 4) Acquisition of experimental techniques for physiological analyses in vivo. 5) Acquisition of experimental skills to investigate signal transduction such as protein phosphorylation.
Class outline	The aim of this class is to acquire the techniques to examine molecular mechanism on the regulation of homeostasis. Specifically, students are required to master 1) techniques for cell culture and functional regulation of cultured cells using gene transfection and protein transduction, 2) isolation of pancreatic β cells and the culture, 3) optical imaging techniques such as intracellular Ca2+ imaging, 4) physiological analyses in vivo, and 5) molecular analyses for signal transduction such as protein phosphorylation.
Required Textbooks	If needed, you will be suitably indicated.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20260)	1, 2, 3, 4	10	other
Course name(Theme)			Instructor		
Research Conducting Program "Practice" I : Molecular Enzymology()			NOMIYAMA Hisayuki		
Goals with their ratio					
Under construction ・・・・100%					
Teaching Style	演習				
Class method	computer manipulation				
Class objectives	Lean computer analyses of RNAseq data of chemokine ligands and receptors				
Goals	Acquire capability of bioinformatics analyses of RNAseq data using R language under UNIX system.				
Class outline	Various RNAseq data are registered in public databases. In this course, RNAseq data of chemokine ligands and receptors are retrieved from the databases, and global analyses of the data are performed.				
Required Textbooks					
Reading list					
Information concerning enrollment					
Assessment methods and criteria/ratios	Understanding of UNIX system and writing programs by R language.				

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21070)	1, 2, 3, 4	8	other
Course name(Theme)			Instructor		
Research Conducting Program "Practice" II : Molecular Enzymology()			NOMIYAMA Hisayuki		
Goals with their ratio					
Under construction ・・・・100%					
Teaching Style	実習及び実技				
Class method	experiments and computer analyses				
Class objectives	Lean how to obtain RNAseq data by experiments and analyze the data with computer				
Goals	Acquire how to obtain RNA seq data by next generation sequencer and analyze vast amounts of the data by computer				
Class outline	Obtain RNAseq data by experiments and analyze the data by UNIX system				
Required Textbooks					
Reading list					
Information concerning enrollment					
Assessment methods and criteria/ratios	mRNA preparation techniques, sample preparation techniques for next generation sequencer and capability of computer analyses				

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20500)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Medical Biochemistry()	Yamagata Kazuya, Yoshizawa Tatsuya

Goals with their ratio
Under construction ‥‥100%

Teaching Style	講義
Class method	Supervisor: Kazuya Yamagata, Tatsuya Yoshizawa Program Schedule: year 1-4, every Friday (6th period) Site and Facilities: Seminar room and laboratories at Medical Biochemistry
Class objectives	The aim is to clarify the molecular mechanisms of metabolic diseases.The students will be required to understand the metabolic pathways of diabetes mellitus and metabolic syndrome. They will be also required to propose an approach to investigate the novel mechanisms of the diseases.
Goals	The aim of this course is to clarify novel metabolic pathways and investigate the molecular mechanisms of diabetes mellitus, metabolic syndrome or atherosclerosis by using biochemical and cellular biological approaches. The obtained results should be reported in scientific journals and scientific meeting. Students will be conducted how to proceed the processes in this Departmental Course.
Class outline	Students will be comprehensively assessed by the ability of understanding and discussing on related literatures to the project, ability of proposing research project, accuracy of experiments, interpretation of experimental results, and presentation/reports in the course. Research article or presentation in the scientific meeting is also taken into consideration to assess the level of achievement in the PhD research.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of the latest knowledge on mechanism of glucose and lipid metabolism regulation and pathology of diabetes. Obtaining novel findings by appropriate and proper experimental approaches. 2) Acquisition of the latest knowledge on mechanism of metabolic syndrome or atherosclerosis development/progression. Obtaining novel findings by appropriate and proper experimental approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21310)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Medical Biochemistry()	YAMAGATA Kazuya, Yoshizawa Tatsuya

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Kazuya Yamagata, Tatsuya Yoshizawa Program Schedule: year 1-4, every Tuesday (6th-7th periods) Site and Facilities: Seminar room and laboratories at Medical Biochemistry
Class objectives	The aim is to clarify the molecular mechanisms of metabolic diseases.The students will be required to understand the metabolic pathways of diabetes mellitus and metabolic syndrome. They will be also required to propose an approach to investigate the novel mechanisms of the diseases.
Goals	The aim of this practical course is to acquire various biochemical, cellular biological and molecular biological experimental technique required for investigating pathogenesis of glucose and lipid metabolism regulation or cardiovascular lesion development/progression resulting from diabetes, metabolic syndrome or atherosclerosis, and for proposing novel therapeutic strategy for these diseases.
Class outline	Students will be comprehensively assessed based on course hours completed, acquisition of experimental skills and reports. Research article or presentation in the scientific meeting will be occasionally approved as a report for grades and credits.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding and acquisition of biochemical, cellular biological and molecular biological experimental methods for analysis of diabetes, metabolic syndrome or atherosclerosis. 2) Ability of proposing and carrying out appropriate plan for research subjects in the field of metabolic medicine.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20240)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Molecular Genetics()	Yuichi Oike, Kazutoyo Terada, Keishi Miyata, Motoyoshi Endo, Tsuyoshi Kadomatsu

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実習及び実技
Class method	Program Schedule: year 1-4, every Tuesday (3rd period) Site and Facilities: staff room and laboratories at Department of Molecular Genetics, as a general rule
Class objectives	The aim of this Departmental Course is understanding the experimental procedures concerning molecular genetics, metabolomics, molecular cell biology and obtaining current information.
Goals	1) Understanding the experimental procedures concerning molecular genetics, metabolomics and molecular cell biology. 2) Proposal of appropriate research projects on the basis of understanding the background on molecular genetics, metabolomics and molecular cell biology. 3) Logical and proper experimental design to execute proposed projects. 4) Obtaining current information concerning molecular genetics, metabolomics, molecular cell biology, and furthermore original and innovative findings.
Class outline	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the roles of the gene products, which are associated with metabolic disorders, stress response, protein quality control or apoptosis. The hypothesis must then be proven by in vitro, in vivo or individual level experiments. Further experiments using corresponding gene-knockout mice will be designed and performed to examine the biological functions of those gene products in tissue or whole body levels. Finally, the experimental results should be reported in academic meeting and international scientific journal. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for the fields, which are related to our Department. In addition, the ability for experimental planning, interpretation and criticism of the results obtained, are also evaluated on oral presentation, reports and so on. The scientific article, presentation at the academic meeting or progress reports at the department meeting are also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21050)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Genetics()	Yuichi Oike, Kazutoyo Terada, Keishi Miyata, Motoyoshi Endo, Tsuyoshi Kadomatsu

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実習及び実技
Class method	Program Schedule: year 1-4, every Monday (2nd period) Site and Facilities: staff room and laboratories at Department of Molecular Genetics, as a general rule
Class objectives	The aim of this class is to acquire the techniques, using animals like mice, tissue or cultured cells, to perform experiments concerning molecular biology, molecular cell biology, biochemistry and histochemistry.
Goals	1) Acquisition of experimental skills, using cultured cells, concerning molecular biology, molecular cell biology and biochemistry. 2) Acquisition of experimental skills, using tissue and whole body, concerning molecular biology, biochemistry and histochemistry. 3) Proposal of appropriate research projects on the basis of understanding the background on molecular genetics, metabolomics and molecular cell biology. 4) Planning and executing logical and proper experimental design to proposed projects.
Class outline	Students are instructed to plan, and to execute experiments to clarify the biological roles of genes and their products, which are supposed to be involved in metabolic disorders, stress response, protein quality control or apoptosis.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s scientific article, presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20520)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Tumor Genetics and Biology()	ARAKI Norie

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Program Schedule: year 1-4, every every Friday (1st-2nd period) Site and Facilities: seminar room and laboratories at Department of Tumor Genetics and Biology, Instruction in Japanese and English + Japanese and English Textbook
Class objectives	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the specific molecular mechanisms of tumor cells compared with normal cells, especially on the cell cycle, differentiation, and apoptosis.
Goals	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the specific molecular mechanisms of tumor cells compared with normal cells, especially on the cell cycle, differentiation, and apoptosis, and obtain some new findings.
Class outline	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the specific molecular mechanisms of tumor cells compared with normal cells, especially on the cell cycle, differentiation, and apoptosis. Recent scientific literatures related to the subject of tumor genetics, molecular and cellular biology will be searched and studied in detail, that is, how to proposed the hypothesis based on the back ground, create experimental evidences, and discuss and prospect on the original and innovative findings. The specific research projects demonstrated must be proven experimentally. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for understanding of tumor related diseases. Finally, the experimental results should be reported in international scientific journals in the fields of oncology, biochemistry, molecular biology, and/or cell biology, All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	“The biology of cancer” by Weinberg RA, Garland Science. "Molecular Biology of The Cell" B Albert et al, Garland Scinece
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding how to investigate the differences of molecular mechanisms between tumor cells and normal cells, especially on the cell cycle, differentiation, and apoptosis. 2) Proposal of appropriate research projects and experimental design on own thesis subject. 3) Novel findings obtained on the abnormal cellular and molecular functions in tumor cells. 4) Proper discussion and review on the original findings obtained. Paper publication and oral presentation on own original findings in the thesis subject with proper discussion against the questionnaires.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21330)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Tumor Genetics and Biology()	ARAKI Norie

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Program Schedule: year 1-4, every Tuesday (6th-7th period) Site and Facilities: seminar room and laboratories at Department of Tumor Genetics and Biology, Instruction in Japanese and English + Japanese and English Textbook
Class objectives	The aim of this class is to acquire the techniques to analyze molecular mechanism and cellular biology of tumor cells, Based on those skills, students should study cancer cell functions aiming at application for cancer research.
Goals	Students should obtain experimental techniques for recent cancer research. Based on those skills, students should study cancer cell functions aiming at application for own cancer research subject and obtain some new findings.
Class outline	The aim of this class is to acquire the techniques to analyze molecular mechanism and cellular biology of tumor cells. Specifically, experimental techniques to be earned in this course include establishment of experimental tumor cellular models after overexpression or knockdown of particular tumor related molecules, and comprehensive screening of tumor related cellular molecules with proteomic differential display, such as 2-Dimentional differential gel electrophoresis with specific fluorescent dyes (2D-DIGE), nanoLC-shotgun based differential proteomics (iCAT, iTRAQ4-plex, 8-Plex) that were newly established in this department, using nano-LC tandem MS (ESI-QQTOF, ESI-QQQ, MALDI-TOF-TOF, DNA array), with the highest sensitivity, resolution, and throughput. Particular emphasis is placed also on and advanced techniques to investigate intracellular signal transduction, tumor cellular observation with time laps-confocal microscopic analysis, bioinformatics on tumor related molecules and so on, all of which will be thoroughly studied in this Departmental Course.
Required Textbooks	“The biology of cancer” by Weinberg RA, Garland Science. "Molecular Biology of The Cell" B Albert et al, Garland Scinece
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to analyze cellular biology, molecular biology, biochemistry on tumor cells, that is, cell culture, microscopic analysis, DNA/RNA preparation, plasmid construction/overexpression, siRNA/knockdown, western blotting, immuno-precipitation, protein purification/indentification/sequensing, PAGE, LC-MS- aperation, bioinformatics, etc. 2) Understanding how to analyze the differentially expressed gene/protein in tumor cells. 3) Execution of experimental techniques to the proposed research projects and proper construction of experimental design on own thesis subject.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20590)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Pathology and Experimental Medicine()	Takaaki Ito

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義・演習
Class method	repeated lectures, discussions and experiments
Class objectives	During studying in this laboratory, students have chances to have research theme(s), think the aims for the studies, make experimental designs, learn techniques necessary, perform experiments, struggle with data, and make scientific article(s) by themselves.
Goals	Graduate students will be evaluated for their course grades and credits based on the course hours completed, their knowledge about scientific information on recent progress in the researches for proliferation and differentiation mechanisms of lung epithelial cell (or other epithelial cell system), and ability to make experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the intra-laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	Focusing on epithelial cells (especially of respiratory tract) , molecular mechanisms on genesis of (lung) cancers and chronic diseases such as interstitial pneumonia will be studied from the pathological points of view.

Each Summary

No.	Date	Theme	Summary
1		Study of mechanisms of diseases from the points of basic science and pathology	Please see the above mentioned.

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated,considering following criteria. 1) Understanding of basic scientific issues of cell biology and pathology of the epithelial systems in normal or neoplastic conditions. 2) Making logical/proper experimental design to study mechanisms of cell proliferation and differentiation of the cell and tissue systems. 3) Finding novel data obtained by appropriate analytical approaches.
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21400)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Pathology and Experimental Medicine()	Takaaki Ito

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Supervisor: Takaaki Ito Program Schedule: year 1-4, every Tuesday (1st-4th periods) Site and Facilities: seminar room and laboratories at Department of Pathology and Experimental Medicine
Class objectives	The aim of this class is to acquire the techniques to study the above research issues.
Goals	To execute experimental projects, the graduate students are acquired to be familiar with various experimental techniques as well as their principle, methods and applications.
Class outline	The aim of this class is to acquire the techniques to study the above research issues. Specifically, experimental techniques to be earned in this course include morphological techniques including immunohistochemistry and in situ hybridization, cell and tissue cultivation, flow cytometrical analyses, various blotting methods, gene transfection techniques, and diagnostic techniques of various pathological samples.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding the cell and tissue morphology in normal and pathological conditions. 2) Acquisition of reliable morphological techniques to study of research projects. 3) Acquisition of experimental skills to investigate signal transduction mechanisms. 4) Acquisition of experimental skills to investigate transcriptiona activity. 5) Acquisition of experimental techniques to produce recombinant genes and proteins for studying cell proliferation and differentiation mechanisms. 6) Understanding the FACS analyses.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20510)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Cell Pathology()	TAKEYA Motohiro, KOMOHARA Yoshihiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Students basically study at seminar room and laboratories of Department of Cell Pathology
Class objectives	The aim of this class is to acquire the techniques to analyze disease process. These techniques include processing of histopathological specimens, immunohistochemical analysis, confocal laser microscopy, electron microscopy, production of monoclonal antibodies, establishment of animal disease models, and various techniques of molecular biology.
Goals	The aim of this class is to acquire the techniques to analyze disease process. These techniques include processing of histopathological specimens, immunohistochemical analysis, confocal laser microscopy, electron microscopy, production of monoclonal antibodies, establishment of animal disease models, and various techniques of molecular biology. Particular emphasis is placed on the techniques to evaluate macrophage functions in various pathological conditions. These include detection of macrophages in pathological tissue specimens, isolation and culture of human and animal macrophages, functional evaluation of macrophage-specific receptors, intracellular processing of phagocytosed materials, detection of cytokines produced by macrophages, and signal transduction pathway during macrophage activation. All of which will be thoroughly studied in this Departmental Course.
Class outline	The aim of this Departmental Course is to learn morphological and functional changes of the cells induced by various pathological processes including metabolic disorders, circulatory disturbances, inflammation, or tumorigenesis. For this purpose students will have an opportunity to examine pathological changes of human tissues obtained at biopsy, surgical operation or autopsy. To pursuit detailed disease process of a selected disease, students are requested to plan and conduct their own research project. During their own research process the students will learn the fundamental skills for pathological diagnosis, ultrastructural observation, cell culture, handling of animals, cell biology and molecular biology. Worldwide information should be collected through scientific literatures to execute their own original research projects. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of the research. Finally, the experimental results should be reported in international scientific journals in the fields of pathology, biochemistry, cell biology or molecular biology. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Ability to explain and evaluate pathological changes of tissue specimens at cellular and tissue levels. 2) Understanding of fundamental techniques to perform pathological experiments. 3) Ability to design the experiments to clarify cellular and molecular pathogenesis of a selected disease process. 4) Ability to propose original research data and discuss according to the recent progress of the research field concerned.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21320)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cell Pathology()	TAKEYA Motohiro, KOMOHARA Yoshihiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Students basically study at seminar room and laboratory of Dep. of Cell Pathology
Class objectives	The aim of this Departmental Course is to learn morphological and functional changes of the cells induced by various pathological processes including metabolic disorders, circulatory disturbances, inflammation, or tumorigenesis. For this purpose students will have an opportunity to examine pathological changes of human tissues obtained at biopsy, surgical operation or autopsy. To pursuit detailed disease process of a selected disease, students are requested to plan and conduct their own research project. During their own research process the students will learn the fundamental skills for pathological diagnosis, ultrastructural observation, cell culture, handling of animals, cell biology and molecular biology. Worldwide information should be collected through scientific literatures to execute their own original research projects. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of the research. Finally, the experimental results should be reported in international scientific journals in the fields of pathology, biochemistry, cell biology or molecular biology. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Goals	The aim of this class is to acquire the techniques to analyze disease process. These techniques include processing of histopathological specimens, immunohistochemical analysis, confocal laser microscopy, electron microscopy, production of monoclonal antibodies, establishment of animal disease models, and various techniques of molecular biology. Particular emphasis is placed on the techniques to evaluate macrophage functions in various pathological conditions. These include detection of macrophages in pathological tissue specimens, isolation and culture of human and animal macrophages, functional evaluation of macrophage-specific receptors, intracellular processing of phagocytosed materials, detection of cytokines produced by macrophages, and signal transduction pathway during macrophage activation. All of which will be thoroughly studied in this Departmental Course.
Class outline	
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Ability to explain and evaluate pathological changes of tissue specimens at cellular and tissue levels. 2) Understanding of fundamental techniques to perform pathological experiments. 3) Ability to design the experiments to clarify cellular and molecular pathogenesis of a selected disease process. 4) Ability to propose original research data and discuss according to the recent progress of the research field concerned.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20490)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Molecular Pathology()	IMAMURA Takahisa

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and practice in the seminar room or experiment rooms of Molecular Pathology Lab.
Class objectives	Practice of analytical methods for blood coagulation, allergic reactions and cancer and understand the principles. Practice methods for protease assay and treatment and analyze protease pathogenic activities.
Goals	By practice of analytical methods for blood coagulation, allergic reactions and cancer, acquire the ability to select proper methods for the research theme and execute.
Class outline	Study blood coagulation by analysis of tissues with infection and allergic reaction and understand that blood coagulation is induced by inflammation and immune reactions and contributes as a host defense system. Learn pathogenic activities of proteases from bacteria and leukocytes through analyzing modulation of plasma and cell functions and practice the analysis methods. Investigate cancer cell C5a-receptor expression in patients' cancer tissues and show relationship between cancer cell C5aR-expression and progression. Effects of C5a on cancer cell biology are explored by Matrigel invasion assay and animal experiments. Guidance for paper writing on the results.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluate abilities to understand and criticize books and papers on the research theme, make a plan for the study, interpret and present the results. Paper publishing, presentation in the society conference and reports can take the place of the reports. Points for the reports: 1. knowledge on molecules of blood coagulation and leukocyte functions, 2. setting-up a proper research theme for analyzing blood coagulation, protease reactions or cancer, 3. experiment planning for the research theme and execution, 4. acquisition of new findings on these fields.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21300)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Pathology()	IMAMURA Takahisa

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and practice in the seminar room or experiment rooms of Molecular Pathology Lab.
Class objectives	Understand the relationships and interaction among inflammation, immune reaction, blood coagulation reaction and cancer and acquire new findings.
Goals	Practice analytical methods for blood coagulation, allergic reactions and cancer, and protease handling and activity assay. Chose proper methods for the research theme and execute.
Class outline	Practice animal experiments, tissue analysis methods, vascular permeability assay, cell culture, migration/invasion assay for leukocytes and cancer cells, protease activity measurement using fluorogenic substrates, immunological methods including antibody preparation, handling of DNA, RNA and proteins and recombinant protein preparation. Using these methods, perform molecular pathological research on blood coagulation, protease pathogenicity and cancer progression.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluate skills of experiment methods and reports. Paper publishing, presentation in the society conference and reports can take the place of the reports. Points for the reports: 1. acquisition of the method for model inflammation induction, 2. acquisition of method for leukocyte separation from blood and function analysis, 3. understanding the principal of protease analysis and acquisition of the methods, 4. understanding the principal of immunological methods including antibody preparation and acquisition of the methods, 5. performance a proper research using these methods, 5. acquisition of new findings on blood coagulation, protease pathogenicity and cancer progression.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20410)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Molecular Pharmacology(Research conducting program "Practice"I: Molecular Phramacology)	NAKANISHI Hiroyuki, UMEDA KAZUAKI, Kikuchi Kouji, Sakamoto Yasuhisa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	
Class method	Searching latest literatures related to research projects, constructing experimental designs, conducting experiments, and reporting the experimental results.
Class objectives	The goal of this Departmental Course is to learn how to identify molecules that regulates the cooperation of cytoskeletons and membranes in various important cell functions, such as cell motility, adhesion, mitosis, endocytosis, and polarization.
Goals	The achievement target is to understand the regulatory mechanism of cytoskeletons and the cooperation between cytoskeleton and membranes in various important cell functions, such as cell motility, adhesion, mitosis, endocytosis, and polarization.
Class outline	The aim of this Departmental Course is to learn how to identify molecules that regulates the cooperation of cytoskeletons and membranes in various important cell functions, such as cell motility, adhesion, mitosis, endocytosis, and polarization. On the basis of results obtained, further experimental design will be constructed to prove the molecular mechanisms by which the identified molecules regulate these cell functions. Specific research projects to be executed should be determined by searching latest literatures related to the cooperation of cytoskeletons and membranes. Research projects can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of biochemistry, molecular biology, cell biology. All instructions in the above-mentioned processes, which are necessary to fulfill requirement for PhD thesis, are conducted in this Department Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding the latest knowledge on the regulatory mechanism of cytoskeletons and the cooperation between cytoskeleton and membranes. 2) Novel original findings related to the regulatory mechanism of cytoskeletons and the cooperation between cytoskeleton and membranes. 3) Understanding the latest knowledge on cell motility, adhesion, mitosis, endocytosis, and polarization. 4) Logical/proper experimental design to identify molecules that regulate cytoskeletons and membranes.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21220)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Pharmacology()	NAKANISHI Hiroyuki, UMEDA KAZUAKI, Kikuchi Kouji, Sakamoto Yasuhisa

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Conducting experiments and reporting the experimental results
Class objectives	The aim of this class is to instruct several experimental techniques, including biochemistry, molecular biology, and cell biology.
Goals	The achievement target is to acquire several experimental techniques, including biochemistry, molecular biology, and cell biology.
Class outline	Experimental techniques to be earned in this course include the followings: 1) methods for isolation and identification of molecules that regulates the reorganization of cytoskeletons and membranes; 2) analysis of the molecular mechanisms by which identified molecules regulate the reorganization of cytoskeletons and membranes; and 3) analysis of the roles of those molecules in cell motility, adhesion, mitosis, endocytosis, and polarization.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement is evaluated according to the following criteria. 1) Acquisition of experimental skills to learn methods for isolation and identification of molecules involved in the reorganization of cytoskeletons and membranes. 2) Understanding how to analysis the reorganization of cytoskeletons and membranes by biochemical, molecular biological, and cell biological method. 3) Understanding of the analysis of cell motility, adhesion, endocytosis, mitosis, endocytosis, and polarization. 4) Logical/proper experimental design to identify molecules that regulate cytoskeletons and membranes.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20600)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Pharmacology and Molecular Therapeutics()	Mitsuyama Shokei, Hasegawa Yu, Koibuchi Nobutaka, Yorinaka Houichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	演習
Class method	Supervisor: Shokei Mitsuyama, Yu Hasegawa ,Hoichi Yorinaka, Nobutaka Koibuchi, Program Schedule: year 1-4, every Tuesday (6th period) Site and Facilities: seminar room and laboratories at Department of Pharmacology and Molecular Therapeutics
Class objectives	The aim of this Course is to understand basics of the mechanism of cardiovascular diseases and pharmacological action of various cardiovascular drugs and to be able to propose scientific hypothesis and analyze data obtained by experiments.
Goals	To propose scientific hypothesis and analyze the data about the mechanism of cardiovascular diseases and pharmacological action of various cardiovascular drugs by learning about the intracellular signaling molecules, the significance of transcription factor and gene expression, and techniques for the analysis.
Class outline	You will learn about the techniques for the analysis of intracellular signal transduction, transcription factors, gene expressions, and analysis of cardiovascular function in vivo. Specific research projects to be executed should be determined by searching latest literatures related to the mechanism of cardiovascular diseases obtained by using the above mentioned techniques. Furthermore, you will learn about the scientific mechanism for the beneficial effects of combination therapy of various cardiovascular drugs with different pharmacological actions.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their understanding and knowledge earned about scientific information on recent progress in the research and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration. Understand (1) how to analyze intracellular signaling molecules, (2) how to analyze gene expression, and (3) the significance of geen-engineering animals, and propose 4) adequate scientific adgenda to elucidate the pharmacological action of various cardiovascular drugs on cardiovascular diseases and 5) logical experimental design for the agenda.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21410)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Pharmacology and Molecular Therapeutics()	Mitsuyama Shokei, Hasegawa Yu, Koibuchi Nobutaka, Yorinaka Houichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Shokei Mitsuyama, Yu Hasegawa, Hoichi Yorinaka, Nobutaka Koibuchi, Program Schedule: year 1-4, every Tuesday (6th-7th periods) Site and Facilities: seminar room and laboratories at Department of Pharmacology and Molecular Therapeutics
Class objectives	The aim of this class is learn about the molecular mechanisms of lifestyle diseases, such as hypertension, diabetes, and obesity, and cerebro-cardiovascular diseases, such as heart failure and dementia. Students will also learn in vivo and in vitro about the pharmacological action of drugs, which are already used clinically and developed, and understand the mechanisms and therapies of those diseases and their future direction.
Goals	Understand recent research findings about the mechanisms of lifestyle disease and cerebro-cardiovascular diseases including heart failure, dementia, and stroke, etc. Understand the pharmacological action of the drugs for those diseases in vivo and acquire techniques to examine the mechanisms. Plan appropriate experimental protocols for the research agenda and analyze exactly the results obtained.
Class outline	We will examine molecular mechanisms of lifestyle diseases, such as hypertension, cardiovascular diseases, and dementia at the level of the intracellular signaling molecules. Furthermore, we will provide research guidance to examine the pharmacological action of cardiovascular drugs, using animal models of cardiovascular diseases, and adequate therapeutic strategies for those diseases.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated based on the acquisition status of experimental techniques and reports. The presentation including discussion at the laboratory and academic meetings is also taken into consideration. 1) Understand how to administer drug in animals. 2) Plan appropriate research protocol to examine the pharmacological action of various cardiovascular drugs on cardiovascular disease models. 3) Appropriate experimental designs for the decided research agenda. 4) To find out the novel mechanism of action of cardiovascular drugs.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20480)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Microbiology(Research Conducting Program "Practice" I : Microbiology)	SAWA Tomohiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tomohiro Sawa,Yosuke Maeda Program Schedule: year 1-4, every Tuesday (6th period) Site and Facilities: seminar room and laboratories at Department of Microbiology
Class objectives	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of molecular pathogenesis of infectious disease and host defense.
Goals	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of molecular pathogenesis of infectious disease and host defense. To publish scientific reports in information all journals.
Class outline	The hypothesis must be proven experimentally. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for prevention and treatment of infectious diseases. Specific research projects to be executed should be determined by searching latest literatures related to the microbial pathogenesis and host defense. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of microbiology, biochemistry, molecular biology, cell biology, and/or infectious diseases. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	No textbooks are specified for this lecture series. Some instructors may have handouts for the lecture.
Reading list	BROCK BIOLOGY OF MICROORGANISMS, 14th Edition, Michael T. Madigan et. al, Prentice Hall International Inc.
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for microbial pathogenesis and host defense mechanism, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21290)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Microbiology(Research Conducting Program "Practice" II : Microbiology)	SAWA Tomohiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Supervisor: Sawa Tomohiro Yosuke Maeda Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Facilities: seminar room and laboratories at Department of Microbiology
Class objectives	The aim of this Jissen II is to acquire the techniques to analyze host responses to various pathogenic bacteria and virus during infections.
Goals	The aim of this Jissen II is to acquire the techniques to analyze host responses to various pathogenic bacteria and virus during infections. To acure experimental experimental skills related to Microbiology,Biochemistry,etc.
Class outline	Specifically, experimental techniques to be earned in this course include establishment of experimental infection models of animals, such as mice and rats, and cultured cells, and analysis of various signaling factors and host defense moleculeS produced in cells and tissues. Particular emphasis is placed also on safe and proper handling of various pathogens (culture methods etc.), identification and analysis of toxins, analytical methods for reactive oxygen species, free radicals, and nitric oxide (NO), proteomics/metabolomics (LC-MS/MS etc.), development of well-characterized infection models with cultured cells and experimental animals, and advanced techniques to investigate intracellular signal transduction, all of which will be thoroughly studied in this Departmental Course.
Required Textbooks	No textbooks are specified for this lecture series. Some instructors may have handouts for the lecture.
Reading list	BROCK BIOLOGY OF MICROORGANISMS, 14th Edition, Michael T. Madigan et. al, Prentice Hall International Inc.
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20290)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Immunology(Research Conducting Program "Practice" I : Immunology)	Oshiumi Hiroyuki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Practices and experiments in laboratory of Immunology.
Class objectives	The aim of this class is to lean the roles of the proteins and genes involved in innate and adaptive immune responses and to conduct the research to reveal the mechanisms of how malfunction or abnormal activation of immune response causes autoimmune disorders and other human diseases.
Goals	The achievement targets are to lean the roles of the proteins and genes involved in innate and adaptive immune responses and to conduct the research to reveal the mechanisms of how malfunction or abnormal activation of immune system causes autoimmune disorders and other human diseases.
Class outline	Recently studies have developed the techniques controlling immune responses, and it is important to reveal underlying mechanism. Lean and discuss the previous results, and then conduct the research to reveal the underlying mechanism of immune regulation techniques. It is also important to understand that the immune responses are sometimes harmful to host, and thus the strict control of immune system is required for clinical application of immunomodulation techniques. For this purpose, develop the human cells or knockout mice, in which the proteins and genes involved in innate and adaptive immune response, are modified, and conduct the research to reveal the effect of each protein or gene defect on human diseases, including autoimmune disorder. Finally, learn how to present the results and how to write manuscripts.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated based on the following points: 1) Understanding of recent knowledge and achievements of new results about the molecular mechanisms of immune responses. 2) Understanding of recent knowledge and achievements of new results about the molecular mechanisms of human diseases caused by abnormal immune response. 3) Learning of knowledge related to the research, planning of experiments, and achievement of new results.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21100)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Immunology(Research Conducting Program "Practice" II : Immunology)	Oshiumi Hiroyuki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Practices and experiments in laboratory of Immunology
Class objectives	The aim of this program is to understand the recent research of immune responses related to infection, vaccine administration, autoimmune disorders, and other human diseases caused by abnormal immune response. Students are guided to conduct the research of those immune responses.
Goals	Understand the recent research of immune responses related to infection, vaccine administration, autoimmune disorders, and other human diseases caused by abnormal immune response. Achievements of new results by conducting the research related to those immune responses.
Class outline	Students are guided to learn the immunological, biochemical, and molecular biological techniques to investigate the immune response related to infection, vaccine administration, autoimmune disorders, and other human diseases related to immune system. For instance, we teach the following techniques: (1) Isolation of dendritic cells, T cells, and B cells from mouse tissues, (2) Analysis of antibody class switch recombination in B cells, (3) Antigen presentation by dendritic cells (4) Flow cytometry analysis of cell surface antigens.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated based on the following points: 1) Achievement of the experimental techniques related to basic cellular biology, biochemistry, and molecular biology. 2) Achievement of the experimental techniques to investigate the protein function in immune cells. 3) Achievement of the experimental techniques to investigate the gene function in immune cells. 4) Achievement of new results by planning and conducting experiments.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20300)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Immunogenetics()	NISHIMURA Yasuharu, Senjiyuu Satoru, IRIE Atsushi, Awai Hirotake

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Instructors: NISHIMURA Yasuharu, SENJIYUU Satoru, IRIE Atsushi, AWAI Hirotake Program Schedule: year 1-4, every Monday (6th period) Site and Facilities: seminar room and laboratories at Department of Immunogenetics
Class objectives	Students should learn important discoveries and new methods and study basic and clinical immunology aiming at the treatment of autoimmune diseases or cancer.
Goals	Students should learn important discoveries and new methods and study basic and clinical immunology aiming at the treatment of autoimmune diseases or cancer and obtain some new findings.
Class outline	Students should learn important discoveries in the recent immunological researches by reading and introducing latest articles. They should learn genes encoding for molecules relevant to immunological function or antigens, examine their pattern of expression, structure of the genes, and collect information on the intra-cellular and intra-tissue localization of the molecules. Based on such information, experiments should be designed to study the functional significance of the molecules in the immune system and to evaluate the possibility of the application of the molecules to clinical immune-therapies. Finally, the results of the above-mentioned studies should be published as scientific papers, and the students will also be trained to present their data in some scientific meetings.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation will be done based on the following criteria. 1) Acquisition of knowledge on the antigen-processing and antigen-recognition and new research achievements. 2) Acquisition of knowledge on the antigens recognized by immune system, immune responses following antigen-recognition and new research achievements. 3) Acquisition of knowledge on the basic researches of immune-regulation or its clinical applications and new research achievements. 4) Acquisition of knowledge regarding their own research themes by learning related literatures, and adequate planning and execution of experiments.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21110)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Immunogenetics()	NISHIMURA Yasuharu, Senjiyuu Satoru, IRIE Atsushi, Awai Hirotake

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Instructors: NISHIMURA Yasuharu, SENJIYUU Satoru, IRIE Atsushi, AWAI Hirotake Program Schedule: year 1-4, every Monday (6th period) Site and Facilities: seminar room and laboratories at Department of Immunogenetics
Class objectives	Students should obtain experimental techniques for recent immunological investigations of human, mouse and other experimental animals. Based on those skills, students should study immune cell functions aiming at application for cancer immunotherapy.
Goals	Students should obtain experimental techniques for recent immunological investigations of human, mouse and other experimental animals. Based on those skills, students should study immune cell functions aiming at application for cancer immunotherapy and obtain some new findings.
Class outline	Students will be taught to obtain experimental techniques of cellular-immunology, biochemistry and molecular biology for the immunological investigations of human, mouse and other experimental animals. Specifically, the following experimental skills will be taught; Isolation and analysis of immune cells, in vivo and in vitro experiments mainly to analyze immune responses triggered by interaction of antigen presenting cells and T lymphocytes; molecular and protein-chemistry-based analyses of molecules with immunological functions and antigenic activities, analyses of antigen-recognition by T lymphocytes and signal transduction related to T lymphocyte activation.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation will be done based on the following criteria for the research theme of each student. 1) Acquisition of techniques for isolation and functional analyses of immune cells. 2) Acquisition of techniques for analyses of expression pattern, structure, and function of proteins expressed in immune system. 3) Acquisition of techniques for analyses of structure, expression pattern, and function of genes expressed in immune system. 4) Acquisition of techniques for immunological analyses using experimental animals. 5) Adequate planning and execution of experiments for conducting their researches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25070)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Molecular Brain Science()	Kazuya Iwamoto

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	Practice with mentor and seminar at the Department of Molecular Brain Science.
Class objectives	The goal of this course is to understand the current status and the relevant methodologies of studies on molecular and genetic basis of brain function and psychiatric disorders. Students will be required to conduct a series of experiments based on the research plan.
Goals	The goal of this course is to understand the current status and the relevant methodologies of studies on molecular and genetic basis of brain function and psychiatric disorders. Students will be required to conduct a series of experiments based on the research plan.
Class outline	The aim of this course is to learn how to propose and to conduct a scientific research plan relevant with psychiatric disorders and brain functions by molecular genetic approaches. Students will learn the relevant topics from the textbooks and the scientific papers, as well as through discussion with the mentor, focusing on the mechanism of somatic mutations, epigenetics, and development of biomarkers. Students will also learn how to explain and publish the results to the peer-reviewed journals. All instructions in these processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this course.
Required Textbooks	not specified
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation will be made on the following topics: 1) understanding the relevant scientific papers and books, methods and research protocols. 2) making a research plan. 3) conducting the relevant experiments based on a research plan. 4) making a presentation and publishing the results to the journal.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25080)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Brain Science()	Kazuya Iwamoto

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	Practice with mentor and seminar at the Department of Molecular Brain Science.
Class objectives	The goal of this course is to understand the current status and the relevant methodologies of studies on molecular and genetic basis of brain function and psychiatric disorders. Students will be required to conduct a series of experiments mainly by molecular biology and bioinfomatic methodologies.
Goals	The goal of this course is to understand the current status and the relevant methodologies of studies on molecular and genetic basis of brain function and psychiatric disorders. Students will be required to conduct a series of experiments mainly by molecular biology and bioinfomatic methodologies.
Class outline	The aim of this course is to learn how to conduct the experiments to reveal molecular genetic basis of psychiatric disorders and brain functions. Students will learn the relevant techniques, and learn how to interpret the data appropriately through discussion with mentor. Students will also learn how to explain and publish the results to the peer-reviewed journals. All instructions in these processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this course.
Required Textbooks	not specified
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation will be made on the following topics: 1) making a research plan. 2) conducting the relevant experiments based on a research plan. 3) making a presentation and publishing the results to the journal.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22890)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Medical Oncology and Translational Research()	Akinobu Hamada, Kenji Tamura, Tetsuya Nakatsura

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Akinobu Hamada, Kenji Tamura, Tetsuya Nakatsura Program Schedule: year 1-4, every Thursday (5th-6th period) Site and Facilities: Conference room at National Cancer Center
Class objectives	The aim of this program is learn how to make protocol for clinical studiese or translational research to slove current issue against medical oncology.
Goals	Students are expected to write original paper to be submitted to internationally recoginized journals and give oral or poster presentation in scientific conferences.
Class outline	The aim of this program is learn how to make protocol for clinical studiese or translational research to slove current issue against medical oncology. Based on their findings, students are expected to write original paper to be submitted to internationally recoginized journals and give oral or poster presentation in scientific conferences.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Proposal of research projects on the basis of understanding medical oncology and translational research. 2) Understanding of clinical data and regulatory sciences. 3) The accomplishment of research projects. 4) Novel findings obtained by appropriate and proper approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23020)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Medical Oncology and Translational Research()	Akinobu Hamada, Kenji Tamura, Tetsuya Nakatsura

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Akinobu Hamada, Kenji Tamura, Tetsuya Nakatsura Program Schedule: year 1-4, every Thuesday (5 period) Site and Facilities: Conference room at National Cancer Center
Class objectives	The aim of this program is to learn how to diagnose, treat, evaluate related to exploratory clinical oncology and translational reseach.
Goals	Students will learn how to make protocols for clinical studies to resolve these clinical issues.
Class outline	The aim of this program is to learn how to diagnose, treat, evaluate related to exploratory clinical oncology and translational reseach. Students will learn how to make protocols for clinical studies to resolve these clinical issues.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of their knowledge of clinical complication and guideline related to exploratory clinical oncology and translational reseach. 2) Acquisition of their knowledge of how to diagnose and treat related clinical oncology. 3) Their accomplishment of research projects.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23060)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Public Health(Health Information Medicine (epidemiology and bio statistics), International Health Medicine, and Health Care Science (Health, Medicine & Welfare system).)	Katoh Takahiko, Wei Changnian, Kitano Takao, Minamoto Keiko, Hisada Aya

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Meeting, individual guidance
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for public health, and ability for research planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Goals	The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for public health, and ability for research planning and interpretation and criticism of the results obtained.
Required Textbooks	Public health related papers
Reading list	Epidemiology -an introduction (KJ Rothman), Designing clinical research (SB Hulley et al.)
Information concerning enrollment	The achievement will be evaluated according to the following criteria. 1) Fundamental understanding of how to read a scientific paper, the methodology of epidemiology, and molecular biology. 2) Acquire the latest knowledge and understand the current conditions of lifestyle-related diseases through reviews of the literature of epidemiology research. 3) Acquire the latest knowledge about the molecular and environmental epidemiology and obtain new results of research in these fields. 4) Acquire established knowledge related to a research theme through a review of the literature, then propose and carry out an appropriate research project.
Assessment methods and criteria/ratios	The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23070)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Public Health()	Katoh Takahiko, Wei Changnian, Kitano Takao, Minamoto Keiko, Hisada Aya

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Meeting, experiment, training
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.
Goals	
Class outline	The contents of this class are as follows: 1) acquisition of the concepts of health, medical care, and the welfare service and system; and 2) understanding molecular epidemiological studies of the interaction between genes and the environment in life-style related disease such as cancer and hypertension, and health disorders like osteoporosis. Concretely, this class provides opportunities for collecting questionnaires & genome DNA in the community and occupational field and then performing epidemiological studies, learning how to prevent illnesses, and making policies for health maintenance & promotion.
Required Textbooks	
Reading list	Epidemiology -an introduction (KJ Rothman), Designing clinical research (SB Hulley et al.)
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Proposal of an appropriate research design for the solution of a research theme. 2) Acquisition of basic experimental skills, such as PCR. 3) Revision of working hypothesis depending on the research results and examination of an appropriate research design. 4) Acquisition of presentation skills to announce the result of research. 5) Consideration of research findings and the writing of a research paper.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21010)	1, 2, 3, 4	10	other
Course name(Theme)			Instructor		
Research Conducting Program "Practice" I : Forensic Medicine(Research Conducting Program "Practice" I : Forensic Medicine)			Nishitani Yoko, Yonemitsu Kousei		
Goals with their ratio					
Under construction ・・・・100%					
Teaching Style	講義				
Class method					
Class objectives	The aim of this course is to learn the skill of forensic pathology and how to diagnose causes of death. Students are also expected to study about the toxicology and biological effects of drugs and alcohol as below: (1) mechanisms of alcoholic liver disease, (2) effect of alcohol on nervous system in Drosophila, (3) analysis of affinity between drugs and proteins, (4) development of new immunological drug screening. Students are expected to submit the paper to research meetings and journals.				
Goals					
Class outline					
Required Textbooks					
Reading list					
Information concerning enrollment	The achievement will be evaluated according to the following criteria. 1) Understanding of the forensic pathology and toxicology. 2) Knowledge about recent problems and arguments in the field. 3) Ability to summarize the background of the research and plan adequate research schedule. 4) Ability to summarize and present their own research results or arguments.				
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on their understanding and knowledge earned about information on recent progress in the research for forensic pathology. The presentation at the academic meetings is also taken into consideration to assess the level of achievement in the PhD research.				

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21820)	1, 2, 3, 4	8	other
Course name(Theme)			Instructor		
Research Conducting Program "Practice" II : Forensic Medicine(Research Conducting Program "Practice" II : Forensic Medicine)			Nishitani Yoko, Yonemitsu Kousei		
Goals with their ratio					
Under construction ・・・・100%					
Teaching Style	実習及び実技				
Class method					
Class objectives	The aim of this course is to discuss each case of forensic autopsies. Participating students are expected to present research results at the academic meetings and write and publish papers in international journals in the relevant fields.				
Goals					
Class outline					
Required Textbooks					
Reading list					
Information concerning enrollment	The achievement will be evaluated according to the following criteria. 1) Understanding the role of forensic medicine as social medicine. 2) Understanding the unusual death and its treatment. 3) Knowledge about recent problems and arguments in the field. 4) Ability to summarize the background of the research and plan adequate research schedule. 5) Ability to summarize and present their own research results or arguments.				
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on their understanding and knowledge earned about information on recent progress in the research for forensic pathology. The presentation at the academic meetings is also taken into consideration to assess the level of achievement in the PhD research.				

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21020)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Bioethics()	Kadooka Yasuhiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	演習
Class method	Seminars including close reading of relevant articles and discussion
Class objectives	Students become acquainted with relavant issues and research methods in the field of bioethics and, then, explore and decide subjects of their own research.
Goals	Understanding of major discussions on bioethical issues already published in relevant international journals Acquiring important knowledge of issues and arguments in the field Making well thought description of the implications of the results of their own research Discussing and summarizing results of their own research Acquiring ability to present and write bioethics paper(s) in English
Class outline	There are two research methods in the field of bioethics. One is theoretical consideration regarding ethics, political philosophy, law, cultural anthropology and the other is empirical investigation using qualitative or quantitative methods. In this subject, participating students will read relevant literatures and analyze ethical issues arising from medical practice, life and death of human, cutting-edge medical technology, biomedical research and science. By attempting to integrate fore-mentioned two methods, students are expected to improve their understanding and learn to conduct a doctoral research in the field. Students are required to determine their research themes, plan bioethical studies, and write and publish their own research paper in international journals in the field of bioethics, applied ethics or philosophy.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are comprehensively evaluated for their course grades and credits based on the course hours completed, their understanding and critical comments on their research topic and materials provided by lecturer, ability to plan their own research, interpret the obtained results and develop valid arguments based on bioethical deliberation. The presentation at the academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21830)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Bioethics()	Kadooka Yasuhiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Seminar and condcut of reseach
Class objectives	Participating students are expected to set a proper research question, conduct a sound research and publish results of the research.
Goals	Acquisition of abilities to review appropriate literature, indentify unresolved bioethical issues and determine their own research themes, to plan research projects, to conduct their research projects as planned, and to discuss the implications of their own research and relevant arguments, summarize and present their own research results, make a presentation at an academic meeting, and write and publish articles in international academic journal(s)
Class outline	The aim of this course is to learn how to accomplish a descriptive empirical research regarding major bioethical problems. Participating students are required to conduct their own research, write and publish research paper(s) in international journals in the relevant fields.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are comprehensively evaluated for their course grades and credits based on the course hours completed, acquisition of research method(s), close analysis and critical interpretation of attributed data, deliberate discussion, and presentation of them. The presentation at the academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21040)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Clinical Ethics()	Kadooka Yasuhiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Seminar including reading of relevant literatures and discussions on them
Class objectives	Participating students are expected to understand moral issued arising from biomedical science, medicine or medical practice, to plan and conduct their own research, and to publish findings obtained from the research.
Goals	Understanding of major discussion on relevant literatures Planning and conducting a research on own topic Making ethical disucussion on findngs obtained from the research Writing and publishing research paper(s)
Class outline	Thre are two theoretical methods of bioethics. One is making theoretical consideration based on ethics, principles, law, cultural anthropology and so on. The other is qualitative or quantitative empirical researches. In this subject, participating students will read literatures targeted at ethical issues of life and death of human, medical practice, cutting-edge medicine and clinical research. After discussing and understanding these issues, they will determine each own research topic, plan and conduct it. Finally they will publish research findings in academic meetings and/or journals in the field of bioethics.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are comprehensively evaluated for their course grades and credits based on the course hours completed, their understanding and critical comments on their research topic and materials provided by lecturer, ability to plan their own research, interpret the obtained results and develop valid arguments based on bioethical deliberation. The presentation at the academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21850)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Clinical Ethics()	Kadooka Yasuhiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	seminars and conduct of research
Class objectives	Participating students set a appropriate research question, conduct a sound research and publish findings obtained from the research.
Goals	Acquisition of abilities to revies relevant literatures, identify unsolved issues and determine a research theme, to create a research project, to conduct it, and to discuss the implication of the research, make arguments and then publish the findings.
Class outline	The aim of this course is to learn how to accomplish a research in the field of clinical ethics. Participating students are required to conduct their own research, write and publish research paper(s) in academic journal(s).
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are comprehensively evaluated for their course grades and credits based on the cuorse hours completed, acquisition of reseach methods, skill of analyzing attributed data and deliberate discussions, and presentation of it. Presentation at academic meetings is also taken into consideration to assess the level of achievement int the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22790)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Respiratory Medicine()	Kourogi Hirotsugu, HIROSAKO Susumu, FUJII Kazuhiko, Ichiyasu Hidenori, Kojima Keisuke, Saeki Shiyou, Okamoto Shinichirou

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face teaching, group learning, e-learning, active learning,
Class objectives	This course aims to help students understand the basics of respiratory anatomy, histology, embryology, physiology, immunology, pathology and clinical physiology.
Goals	Analyzing the principles of the pathophysiology of the airway and pulmonary diseases, and present the results in the meetings and the manuscripts.
Class outline	Students should learn inflammatory mechanism and degenerative mechanisms of airway and pulmonary diseases by analyzing the pathophysiology with immunological, infectious, toxic, progenitor cell- and stem cell-death and degeneration. By analyzing the pathophysiology, clinical application for treatment should be investigated.
Required Textbooks	Journals: Nature, Science, American Journal of Respiratory and Critical Medicine, Journal of Clinical Investigation, etc.
Reading list	Journals: Nature, Science, American Journal of Respiratory and Critical Medicine, Journal of Clinical Investigation, etc.
Information concerning enrollment	Have basic knowledge concerning what is researched in the course.
Assessment methods and criteria/ratios	Research reports, oral presentation in the research conferences and annual meetings of Japanese Respiratory Society, American Thoracic Society and European Respiratory Society. Finally, manuscripts of the research is assessed.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22920)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Respiratory Medicine()	Kourogi Hirotsugu, FUJII Kazuhiko, Ichiyasu Hidenori, Kojima Keisuke, Saeki Shiyou, Okamoto Shinichirou

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face teaching, group learning, e-learning, active learning.
Class objectives	This course aims to help students understand the basics of respiratory anatomy, histology, embryology, physiology, immunology, pathology and clinical physiology for translational research.
Goals	Analyzing the principles of the pathophysiology of the airway and pulmonary diseases, present the results in the meetings and the manuscripts.
Class outline	Students should learn inflammatory mechanisms and degenerative mechanisms of airway and pulmonary diseases by analyzing the pathophysiology with immunological, infectious, toxic, progenitor cell-and stem cell-death and degeneration. By analyzing the pathophysiology, clinical application for treatments should be investigated.
Required Textbooks	Journals: Nature, Science, American Journal of Respiratory and Critical Medecine, Journal of Clinical Investigation, etc.
Reading list	Journals: Nature, Science, American Journal of Respiratory and Critical Medecine, Journal of Clinical Investigation, etc.
Information concerning enrollment	Having basic knowledge concerning what is researched in the course.
Assessment methods and criteria/ratios	Research reports, oral presentation in research coferences and annual meetings of Japanese Respiratory Society, American Thoracic Society, and European Respiratory Society. Finally, manuscripts of the research is assessed.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22800)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Cardiology()	Hokimoto Seiji, OGAWA Hisao, Kaikita Kouichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	First, the hypothesis must be proven experimentally. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for prevention and treatment of cardiovascular diseases. Specific research projects to be executed should be determined by searching latest literatures related to the cardiovascular diseases. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of cardiovascular medicine.
Class objectives	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of pathogenesis of cardiovascular diseases.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research, and the ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	The content of this Course is the followings: 1) To learn the coagulation and fibrinolytic biomarkers that are related to the pathogenesis of acute coronary syndrome, and discuss the merits and demerits of the clinical assessment in the platelet activation; 2) To learn the clinical evidences for Japanese population based on prospective studies linking with clinical practice; 3) To learn the theories and methods of the gene analysis by using the DNA microarray; 4) To establish the mouse models of experimental myocardial infarction or ischemia / reperfusion, analyze the moleculesrelated to cardiac remodeling and myocardial ischemia / reperfusion injury; 5) To learn the mechanism in the expression of atherogenic molecules in cultured vascular endothelial cells and vascular smooth muscle cells; 6) To explore the stimulating factors which cause the myocardial hypertrophy by using the rat neonatal myocardium. 7) To learn the theories and methods to generate genetically altered mice. 8) To learn how to evaluate physiological parameters in small animal by using echocardiography and micro catheter.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Proposal of appropriate research projects on the basis of understanding the background on the pathogenesis of cardiovascular diseases. 2) Understanding how to perform the experiments related to the basic and clinical cardiovascular researches described in the Course Description. 3) Appropriate experimental design to identify the important factors for the pathogenesis of cardiovascular diseases. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original findings that can contribute to better understanding for cardiovascular pathogenesis. 6) Acquisition of knowledge and skills to generate genetically altered mice and to evaluate their phenotypes.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22930)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cardiology()	Hokimoto Seiji, OGAWA Hisao, Kaikita Kouichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	1. ELISA to measure the biomarkers of blood coagulation and fibrinolysis in ischemic heart diseases. 2. platelet aggregation by using the optical density change or light scattering. 3. isolation and culture of vascular endothelial and smooth muscle cells, and neonatal rat cardiomyocytes. 4. Protein or mRNA extraction, Western blot, and real-time RT-PCR analysis. analysis of the genetically modified mice
Class objectives	The aim of this class is to acquire the techniques to analyze the pathogenesis and mechanism of cardiovascular diseases.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’ s presentation and discussion at the laboratory and academic meetings.
Class outline	Specifically, experimental techniques to be earned in this course include ELISA to measure the biomarkers of blood coagulation and fibrinolysis in ischemic heart diseases. The experimental techniques also include the measurements of platelet aggregation by using the optical density change or light scattering. You learn how to isolate and culture vascular endothelial and smooth muscle cells, and neonatal rat cardiomyocytes. Difference of rat myocyte hypertrophy induced by various stimulators is observed in light microscopy. Protein or mRNA extraction, Western blot, and real-time RT-PCR analysis by using the samples of cardiovascular tissues and cultured cells are also studied in this Departmental Course. You learn the theories and methods how to generate genetically altered mice. Their phenotypes are analyzed by various modalities including echocardiography and micro catheter.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Acquisition and understanding of skills to perform ELISA for the measurement of the biomarkers of blood coagulation and fibrinolysis. 2) Understanding how to measure platelet aggregation by using the optical density change or light scattering. 3) Acquisition of experimental techniques to isolate and culture vascular endothelial and smooth muscle cells, and neonatal rat cardiomyocytes. 4) Acquisition of experimental skills to observe phenotype difference of rat myocyte hypertrophy induced by various stimulators. 5) Understanding of protein or mRNA extraction, Western blot, and real-time RT-PCR analysis from the samples of cardiovascular tissues and cultured cells.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20700)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Endocrinology and Metabolism(Endocrinology and Metabolism, Departmental Course “Jissen” I)	ARAKI Eiichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Practices and experiments in laboratory. Presentation and group discussion.
Class objectives	Learn the molecular biological methods that are used for the analysis on the mechanisms of the action of hormones and the cause of metabolic or endocrinological diseases from literature search . Learn how these techniques are applied to reveal underlying mechanism and to create the novel treatment of the metabolic or endocrinological diseases. Discuss concerning the meaning and application to diagnosis and to treatment of the obtained results based on experimental analysis at the levels of gene, protein, organs and individuals on the mechanisms of the metabolic or endocrinological diseases. Learn how to present the results and make manuscripts.
Goals	Explain the molecular biological methods that are used for the analysis on the mechanisms of the action of hormones and the cause of metabolic or endocrinological diseases from literature search . Explain how these techniques are applied to reveal underlying mechanism and to create the novel treatment of the metabolic or endocrinological diseases. Discuss concerning the meaning and application to diagnosis and to treatment of the obtained results based on experimental analysis at the levels of gene, protein, organs and individuals on the mechanisms of the metabolic or endocrinological diseases. Make the presention of the results and manuscripts.
Class outline	Select several manuscripts concerning the mechanisms of the action of hormones and the cause of metabolic or endocrinological diseases, and learn the molecular biological methods that are used for the analysis. Moreover, how these techniques are applied to reveal underlying mechanism and to create the novel treatment of the metabolic or endocrinological diseases will be maneuvered by the rap session. Furthermore, after the intensive analysis at the levels of gene, protein, organs and individuals on the mechanisms of the metabolic or endocrinological diseases, make discussion concerning the meaning and application to diagnosis and to treatment of the obtained results. Finally, learn how to present the results and make manuscripts.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	It depends on reports. The presentation technique including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21510)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Endocrinology and Metabolism(Endocrinology and Metabolism, Departmental Course “Jissen” II)	ARAKI Eiichi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Practices and experiments in laboratory. Presentation and group discussion.
Class objectives	Lean the genetic engineering technique to analyse the function of genes involve in metabolic and endocrine diseases. Learn the methods to analyze the function of the mutated genes by using reverse genetical techniques.
Goals	1) design an expression vector which express appropriate molecule, 2) construct the vector and introduce it into cells, 3) learn methods to analyze the expression and function of the expressed molecule, 4) learn methods to identify mutations of the genes involve in metabolic and endocrine diseases, 5) learn methods to analyze the function of the mutated genes by using reverse genetical techniques.
Class outline	Practice about the followings, 1) design of a expression vector which express appropriate molecule, 2) construct the vector and introduce it into cells, 3) methods to analyze the expression and function of the expressed molecule, 4) methods to identify mutations of the genes involve in metabolic and endocrine diseases, 5) methods to analyze the function of the mutated genes by using reverse genetical techniques.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	It depends on reports. The presentation technique including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20720)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Nephrology(Nephrology Departmental Course “Jissen” I)	Mukouyama Masashi, Nakayama Yuushi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	演習
Class method	group learning
Class objectives	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the elucidation of the molecular pathophysiology of the kidney diseases.
Goals	1) Understanding the functional heterogeneity of the nephron segment. 2) Understanding the distribution of the ion channels, ion transporters, and hormonal receptors along the nephron segment. 3) Understanding the pathophysiology of the kidney diseases related to the functional disorders of the ion channel/transporters and the hormonal receptors.
Class outline	The nephron is composed of a variety of differentiated epithelial cells and the function of each nephron segment is completely different from the others. Students should learn the heterogeneity of each nephron segment function and the diversity of the kidney disease phenotypes that is caused by the disorder of a single nephron segment.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Students should complete more than 75% of the total course hours. 2) Understanding the functional heterogeneity of the nephron segment. 3) Understanding the distribution of the ion channels, ion transporters, and hormonal receptors along the nephron segment. 4) Understanding the pathophysiology of the kidney diseases related to the functional disorders of the ion channel/transporters and the hormonal receptors.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21530)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ : Nephrology(Nephrology Departmental Course “Jissen” Ⅱ)	Mukouyama Masashi, Nakayama Yuushi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	group learning
Class objectives	The aim of this class is to acquire the techniques to analyze the expression levels of specific genes and proteins from the isolated kidneys from rats and mice as well as from the cultured mammalian cells.
Goals	1) Understanding the techniques to isolate and analyze the expression levels of mRNA and the DNA sequences. 2) Understanding the techniques to isolate and analyze the expression levels of protein and its function. 3) Understanding the techniques to culture mammalian cells. 4) Understanding the intracellular communications and function of various proteins.
Class outline	Students should learn the techniques to analyze the expression levels of specific genes and proteins from the isolated kidneys from rats and mice as well as from the cultured mammalian cells. Specifically, students are required to learn the regulatory mechanisms of gene expression by measuring the expression levels of ion channels/transporters in the animal disease model. Also, students are required to learn the molecular pathophysiology of the “ion channelopathies” by investigating the structure-function relationships of the ion channel/transporters.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Students should complete more than 75% of the total course hours. 2) Understanding the techniques to isolate and analyze the expression levels of mRNA and the DNA sequences. 3) Understanding the techniques to isolate and analyze the expression levels of protein and its function. 4) Understanding the techniques to culture mammalian cells. 5) Understanding the intracellular communications and function of various proteins.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20690)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Gastroenterology and Hepatology()	Yutaka SASAKI, Motohiko TANAKA, Hideaki Naoe, Takashi SHONO, Takehisa WATANABE, Masakuni TATEYAMA, Junpei HASHIGO

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	Face-to-face class lesson and group learning would be provided.
Class objectives	To analyze the molecular mechanisms underlying inflammation-associated carcinogenesis of gastorintestinal tract, liver, pancreas, and biliary tract.
Goals	To comprehend the molecular mechanisms underlying inflammation-associated carcinogenesis of gastorintestinal tract, liver, pancreas, and biliary tract, and also to propose a therapeutic strategy to pervent carcinogenesis.
Class outline	Recent progress in medicine has identified molecular mechanisms underlying gastrointestinal, hepatic, pnacreatic and biliary diseases, leading to the development and application of new therapies. Aim of this course is 1) to learn molecular mechanisms underlying inflammation and carcinogenesis in the gastrointestinal tract, liver, pancreas and biliary tract 2) to comprehend how molecular mechanisms would be modulated and regulated for the purpose of treatment on gastrointestinal and liver diseases.
Required Textbooks	
Reading list	
Information concerning enrollment	To obtain basical information related to carcinogenesis
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned in the course, the report regarding contents in the course. The students, who have completed more than 75% of the whole course, would be required to submit a report regarding the course lectures. The report will be evaluated regarding the criteria listed below. 1) Comprehension on variety of gastrointestinal and liver cancers and their incidence rates. 2) Comprehension on precancerous lesions of gastrointestinal and liver cancers 3) Comprehension on the relation between inflammation and carcinogenesis

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21500)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Gastroenterology and Hepatology()	Yutaka SASAKI, Motohiko TANAKA, Hideaki Naoe, Takashi SHONO, Takehisa WATANABE, Masakuni TATEYAMA, Junpei HASHIGO

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face class lesson and group learning would be provided.
Class objectives	To learn the basic theory of molecular biological approach to analyse the mechanism of carcinogenesis, and to obtain molecular biological techiniques.
Goals	To comprehend the basic theory of molecular biological approach to analyse the mechanism of carcinogenesis, and to be able to handle molecular biological techiniques.
Class outline	Aim of this course is 1) to read papers by turns regarding diagnosis and treatments in order to comprehend the pathogenesis of gastrointestinal and liver diseases 2) to discuss the present and the future of diagnosis and treatments, 3) to understand the basic information of molecular biological approach,4) to obatin molecular biological techiniques.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned in the course, the report regarding contents in the course. The students, who have completed more than 75% of the whole course, would be required to submit a report regarding the course lectures. The report will be evaluated regarding the criteria listed below. 1) Comprehension on current diagnosis of gastrointestinal and liver cancers 2) Comprehension on current treatments of gastrointestinal and liver cancers 3) Comprehension on future progress in therapeutics on gastrointestinal and liver cancers

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
20710	2016whole year	Graduate School of Medical Sciences(20710)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Hematology(Hematology Departmental Course “Jissen” I)	OKUNO Yutaka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	
Class objectives	
Goals	
Class outline	The aim of this course is to advance the knowledge and understanding of the attendees on the emergence mechanism of leukemia, malignant lymphoma, and multiple myeloma and historical processes on the emergence and to help the attendees learn molecular mechanisms of ontogeny and differentiation of stem cells and molecular basis of hematological malignancies. Identification of new molecular targeted drugs will be discussed and examined. Finally, the experimental results are to be reported at the international conferences and published on international scientific journals.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding of ontogeny and differentiation of hematopoietic stem cells 2) Understanding of emergence of hematological malignancies 3) Understanding of basic and clinical research aiming at development of new therapeutic drugs 4) Planning and execution of experiments on the relevant research themes

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
21520	2016whole year	Graduate School of Medical Sciences(21520)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Hematology(Hematology Departmental Course “Jissen” II)	MITSUYA Hiroaki, OKUNO Yutaka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	
Class objectives	
Goals	
Class outline	The aim of this class is to learn the basis of classification, characteristics, and treatment of hematological malignancies. Understanding of molecular targeted drugs used in clinical fields and their effects is also aimed.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding of classification and characteristics of hematological malignancies 2) Understanding of molecular targeted drugs of hematological malignancies 3) Understanding of in vivo and in vitro evaluation methods of drug treatment

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
20770	2016whole year	Graduate School of Medical Sciences(20770)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
esearch Conducting Program "Practice" I : Rheumatology(Rheumatology Departmental Course “Jissen” I)	Hirata Shinya

Goals with their ratio	
Under construction ・・・・100%	
Type of Class	Practice
Teaching Method	
Course Goals	
Course Achievement Targets	
Outline	Recently, the several novel findings of immune regulation and immune tolerance are reported, and the investigation of pathogenesis and development of treatments is performed in autoimmune diseases. The aim of this course is the understanding of immune system, immune tolerance, mechanisms of autoimmune diseases and control of immune reaction, and the practicing of hypothesis formulation and verification. The clinical samples are analyzed by cell biologic and molecular genetic approaches including cell proliferation assay, induction of apoptosis, measurement of cytokines, analysis of cell surface marker, cytotoxic assay, PCR and genetic analysis. In addition, disease-animal models are used. Experimental results are to be reported at conferences and published in scientific journals.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The achievement will be evaluated according to the following criteria. 1) Acquisition of the newest information on mechanisms of emergence of autoimmune diseases 2) Acquisition of the newest information on antigen recognition by immune system 3) Acquisition of the newest issues on clinical application of control of immune reactions 4) Acquisition of analysis of clinical samples and animal models 5) Planning and execution of experiments of the relevant research based on the scientific information

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
21580	2016whole year	Graduate School of Medical Sciences(21580)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ ; Rheumatology(Rheumatology Departmental Course “Jissen” Ⅱ)	Hirata Shinya

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	
Class objectives	
Goals	
Class outline	The progress of immunology develops the novel examinations and treatments in autoimmune diseases. However, cases with several complications or side effects caused by strong immunosuppressive therapies increase. The aim of this course is to the practicing statistic analysis of complications or side effects in case with rheumatoid disease, and analysis of clinical samples by using cell biologic and molecular genetic approaches. Experimental results are to be reported at conferences and published in scientific journals.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills of detection of auto antibodies, and understanding ayalysis of antigen-antibody reactions 2) Acquisition of update information on control of immune reactions and its clinical applications 3) Planning and execution of the experiment on relevant research projects based on the newest scientific information 4) Acquisition of the newest information on factors related with complications or side effects in autoimmune diseases

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
20580	2016whole year	Graduate School of Medical Sciences(20580)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Infectious Diseases(Infectious diseases Departmental Course “Jissen” I)	KAWAGUCHI Tatsuya, MIYAKAWA Toshikazu, NAKATA Horotomo

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	
Class objectives	
Goals	
Class outline	The aim of this course is to advance the knowledge and understanding of the attendees on the issues of development of anti-human immunodeficiency virus (HIV) drugs, the mechanisms of action of such drugs, and the mechanisms of drug resistance of the virus and further to learn selected methods of drug design for overcoming the resistance and exploration of new molecular targets for development of new drugs. Experiments for elucidation of the resistance and screening for the drug resistance are also planned and practiced. The results should be summarized, reported at the international conferences, and published on international scientific journals.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding of life cycle of HIV through invasion to liberation from host cells and responses of the infected host 2) Understanding of structures and functions of HIV genes 3) Understanding of characteristics of anti-HIV drugs and mechanisms of drug resistance 4) Understanding and practice of methods of cell culture, isolation of virus, gene recombination 5) Planning and execution of experiments along the research themes

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
2190	2016whole year	Graduate School of Medical Sciences(21390)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Infectious Diseases(Infectious diseases Departmental Course “Jissen” II)	KAWAGUCHI Tatsuya, MIYAKAWA Toshikazu, NAKATA Hirotomo

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	
Class objectives	
Goals	
Class outline	The aim of this class is to learn experimental methods for research of emerging and re-emerging infections and further to learn usage of clinical samples in safe, isolation of virus and immune cells, epidemiological research methods, tissue culture, and basic methods of immunobiology and molecular biology.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding of emergence, re-emergence, and opportunistic infections. 2) Understanding of epidemiological methods for nosocomial infections

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20750)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Neurology()	Andou Yukio, Yamashita Satoshi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	Supervisor: Yukio Ando, Satoshi Yamashita Program Schedule: year 1-4, every Tuesday(6th period) Site and Facilities: seminar room and laboratories at Department of Neurology
Class objectives	The aim of this lecture is acquisition of molecular biological techniques and ideas towards understanding the pathogenesis of intractable diseases of neurology area and developing novel treatment for them.
Goals	Graduate students must understand and criticize the articles regarding research theme, as well as plan the experiments of their own. Moreover, they must interpret, orally present and report the results of the experiments.
Class outline	The aim of this Departmental Coarse is to learn the achievement of modern neurology regarding etiology, and pathologic elucidation of hereditary neurodegenerative diseases. Students are required to practice on several disease models and evaluate likelihoodof clinical application and future prospects of gene therapy as well as regenerative therapy on such diseases. Furthermore, characteristics of various viral vectors to be used in gene therapies, problems in exon skipping, and possibility of regenerative therapy to use iPS and stem cells for advanced cases (usually excluded from gene therapy nor exon skipping therapy), are studied during the coarse. All research results mentioned above are summarized in a thesis, and a guidance will be provided to give an oral presentation.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Graduate students will be evaluated according to the following criteria. 1) Learning the latest knowledge about neuroscience, and obtaining a novel knowledge from their own experiments. 2) Learning the latest knowledge about the basic and clinical research in gene therapy, exon skipping and regenerative medicine and obtaining a novel knowledge from their own experiments. 3) Proposal of appropriate research projects and performing original and innovative experimental studies on the bases of conventional knowledge associated with their study theme.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21560)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Neurology()	Andou Yukio, Ueda Mitsuharu

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	Supervisor: Yukio Ando, Mitsuharu Ueda Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Fascilities: seminar room and laboratories at Department of Neurology
Class objectives	The aim of this lecture is acquisition of molecular biological techniques and ideas towards understanding the pathogenesis of intractable diseases of neurology area and developing novel treatment for them.
Goals	Graduate students must understand and criticize the articles regarding research theme, as well as plan the experiments of their own. Moreover, they must interpret, orally present and report the results of the experiments.
Class outline	The aim of this class is to acquire the basic techniques required to develop the gene therapy, regenerative therapy for laboratory mice as well as human subjects, such as cell culture, immuno-histochemistry, Western blotting, and molecular biologic experimental maneuvers. Depending on need for their own projects, training about observation of immunostaining specimens, electron microscope, a viral vector making, and cell culture will be trained.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Graduate students will be evaluated according to the following criteria. 1) Learning the latest knowledge about neuroscience, and obtaining a novel knowledge from their own experiments. 2) Learning the latest knowledge about the basic and clinical research in gene therapy, exon skipping and regenerative medicine and obtaining a novel knowledge from their own experiments. 3) Proposal of appropriate research projects and performing original and innovative experimental studies on the bases of conventional knowledge associated with their study theme.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20740)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Pediatrics()	NAKAMURA Kimitoshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	
Class objectives	Study of Pediatrics covers various diseases. It is important to develop an analysis of the clinical condition, diagnosis and therapy with the latest knowledge. In this course, students should focus on genetic diseases, gene therapy and regenerative medicine related to these diseases. We discuss and exchange the basic information and a research task of pediatric diseases.
Goals	The following contents should be explained. 1) the outline of genetic diseases 2) stem cell 3) gene therapy 4) regenerative medicine
Class outline	This course focuses on genetic diseases, gene therapy and regenerative medicine related to these diseases. We discuss and exchange the basic information and a research task of pediatric diseases. The basic analysis method is learned about the hereditary disorder and the malignant tumor during childhood. A gene therapy and regenerative medicine are hopeful treatment the near future. Ethical problem related to childhood disease is also important.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The following contents will be evaluated by reports. 1) the outline of genetic diseases 2) stem cell 3) gene therapy 4) regenerative medicine

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21550)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Pediatrics()	NAKAMURA Kimitoshi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	
Class objectives	Various animal models are created and used for understanding of pediatric diseases. In this course, students should focus on genetic diseases, gene therapy and regenerative medicine using an animal model. We discuss and exchange the basic information and a research task of pediatric diseases.
Goals	The following contents should be explained. 1) the outline of genetic diseases 2) stem cell 3) animal model 4) regenerative medicine
Class outline	A clinical condition analysis of hereditary disorder, a gene therapy and tissue engineering using an animal model are studied. It's done with a target in detail to mention an experimental outcome of incurable disease treatment. A model animal for hereditary liver disorders, endocrine disorders and neurological disorders are the target for study. This course focuses on genetic diseases, gene therapy and regenerative medicine using an animal model. We discuss and exchange the basic information and a research task of pediatric diseases. Understanding of pathophysiological mechanisms, improvement of clinical condition by cell transplantation and gene therapy
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The following contents will be evaluated by reports. 1) the outline of genetic diseases 2) stem cell 3) animal model 4) regenerative medicine

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23080)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Diagnostic Medicine(Diagnostic Medicine)	Matsui Hirotaka

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	seminar room and laboratories at the Department of Molecular Laboratory Medicine
Class objectives	The aim of this course is to learn the process of some notable phenomenal findings in the field of laboratory medicine, and how to verify the working hypotheses for its pathogenesis by giving actual examples.
Goals	Finally, the research progresses in the above-mentioned processes are necessary to fulfill requirements for PhD thesis, and reported by oral presentation.
Class outline	The aim of this course is to learn the process of some notable phenomenal findings in the field of laboratory medicine, and how to verify the working hypotheses for its pathogenesis by giving actual examples. Especially, we will focus on collecting information about laboratory procedure and diagnostic medicine required for “translational research”, which links basic medical sciences and clinical researches. Research projects should be proposed and examined by using the methods of molecular genetics, cell biology, molecular biology, developmental engineering, and laboratory medicine. Human samples (bloods, tissues, spinal and other various fluids) will be used and investigated for research projects. On the basis of laboratory medicine, new methods which can make a diagnosis and the analysis of the pathological condition should be studied.
Required Textbooks	Not specified.
Reading list	Papers will be informed on site.
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Acquisition of experimental skills for laboratory medicine of various diseases and obtaining novel findings. 2) Understanding how to perform the experimental procedures in laboratory medicine and making research progress. 3) Acquisition of experimental skills for basic medical sciences associated with development of brand-new methods or clinical applications and obtaining new results. 4) Logical/proper experimental design for specific research project by appropriate and proper analytical approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23090)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Diagnostic Medicine(Diagnostic Medicine)	Matsui Hirotaka

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	seminar room and laboratories at the Department of Molecular Laboratory Medicine
Class objectives	The education is aimed at the development of students' faculties to plan and execute experiments that will be necessary to settle unresolved issues by the students themselves.
Goals	The experiments in this course include gene mutation searching, cDNA cloning and functional analysis of mutant proteins. Students are expected to learn the process through which research objectives are attained by the students themselves.
Class outline	Recent advance in comprehensive genome analysis led to the identification of many somatic as well as germ-line gene mutations that are involved in the development of malignancies. Therefore, it is expected that malignancies will be able to be diagnosed at a high sensitivity in the department of diagnostic medicine in the near future. Meanwhile, oncologists engaged in diagnostic medicine are required to understand molecular pathogenesis of malignancies. With these backgrounds, the experiments in this course include gene mutation searching, cDNA cloning and functional analysis of mutant proteins. The education is aimed at the development of students' faculties to plan and execute experiments that will be necessary to settle unresolved issues by the students themselves. In addition, newly-introduced analytical techniques in laboratory medicine including mass-spectrometry will be introduced to the students.
Required Textbooks	Not specified.
Reading list	Papers will be informed on site.
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student's presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20630)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Diagnostic Radiology("Practice" I : Diagnostic Radiology)	YAMASHITA Yasuyuki, IKEDA Osamu

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	Conference
Class objectives	Understanding on imaging studies
Goals	Understanding on imaging studies
Class outline	Update of knowledge of CT, MR and PET, Presentation of imaging studies. Following conferences will be given; Program Schedule: year 1-4, every Tuesday 7:00 (A total of 15 studies); Neuroradiology Conference; Head&Neck-Radiology Conference; Oral and Maxillofacial Surgery-Radiology Conference; Gastroenterological Surgery-Pathology-Radiology Conference; Thoracic Surgery-Pathology- Radiology Conference; Obstetrics and Gynecology-Radiology Conference Site and Facilities: Diagnostic Radiology Conference Room 6F; Each Conference Room
Required Textbooks	
Reading list	
Information concerning enrollment	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for diagnostic radiology, and ability for experimental and clinical study planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration.
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding and knowledge of the principle and method of diagnostic radiology and radiological anatomy. 2) Proposal and execution of appropriate research projects in imaging studies. 3) Proposal and execution of appropriate research projects in other imaging techniques.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21440)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ : Diagnostic Radiology("Practice" Ⅱ : Diagnostic Radiology)	YAMASHITA Yasuyuki, IKEDA Osamu

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	Conference
Class objectives	Understanding on imaging studies
Goals	Understanding on imaging studies
Class outline	Update of knowledge of CT, MR and PET, Presentation of imaging studies. Following conferences will be given; Program Schedule: year 1-4, every Tuesday 7:00 (A total of 15 studies); Neuroradiology Conference; Head&Neck-Radiology Conference; Oral and Maxillofacial Surgery-Radiology Conference; Gastroenterological Surgery-Pathology-Radiology Conference; Thoracic Surgery-Pathology- Radiology Conference; Obstetrics and Gynecology-Radiology Conference Site and Facilities: Diagnostic Radiology Conference Room 6F; Each Conference Room
Required Textbooks	
Reading list	
Information concerning enrollment	Students are evaluated for their course grades and credits based on the course hours completed, the degree of understanding of diagnostic radiology acquired during the course and reports submitted for evaluation.
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding and knowledge of the principle and method of diagnostic radiology and 3-D imaging. 2) Proposal and execution of appropriate research projects in 3-D imaging. 3) Proposal and execution of appropriate research projects in other imaging techniques.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20620)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Radiation Oncology()	OYA Natsuo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Natsuo Oya Program Schedule: year 1-4, every Friday (6th period) Site and Facilities: Radiotherapy Planning Room , New Clinical Laboratory and Examination Center BF
Class objectives	The aim of this Departmental Course is to learn how biological and technological development has been applied to cancer radiotherapy and how it has contributed to the improvement of cancer treatment outcome.
Goals	The aim of this Departmental Course is to learn how biological and technological development has been applied to cancer radiotherapy and how it has contributed to the improvement of cancer treatment outcome.
Class outline	The aim of this Departmental Course is to learn how biological and technological development has been applied to cancer radiotherapy and how it has contributed to the improvement of cancer treatment outcome. By patients undergoing radiotherapy, practical knowledge of radiation oncology and radiotherapy, including the role of radiotherapy in cancer treatment, the procedure of eligibility decision, the technique of radiotherapy field setting and dose fractionation planning, the technique of irradiation, will be discussed. In addition, the principle and method of high-precision 3-D conformal external beam radiotherapy, including stereotactic radiotherapy, intensity modulated radiotherapy and functional image-incorporating radiotherapy, will be also discussed by participating in treatment planning or phantom experiments. The experimental or clinical results should be reported in international scientific journals in the fields of radiation oncology.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for radiation oncology, and ability for study planning and interpretation of the results obtained. The achievement criteria. 1) Understanding and knowledge of the principle and method of radiation oncology and high-precision 3-D conformal external beam radiotherapy. 2) Proposal and execution of appropriate research projects in high-precision 3-D conformal external beam radiotherapy.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21430)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Radiation Oncology()	OYA Natsuo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Natsuo Oya Program Schedule: year 1-4, every Tuesday (6th-7th periods) Site and Facilities: Radiotherapy Planning Room , New Clinical Laboratory and Examination Center BF
Class objectives	By patients undergoing radiotherapy, practical knowledge of radiation oncology and radiotherapy, including the role of radiotherapy in cancer treatment, the procedure of eligibility decision, the technique of radiotherapy field setting and dose fractionation planning, the technique of irradiation, will be discussed.
Goals	By patients undergoing radiotherapy, practical knowledge of radiation oncology and radiotherapy, including the role of radiotherapy in cancer treatment, the procedure of eligibility decision, the technique of radiotherapy field setting and dose fractionation planning, the technique of irradiation, will be discussed.
Class outline	By patients undergoing radiotherapy, practical knowledge of radiation oncology and radiotherapy, including the role of radiotherapy in cancer treatment, the procedure of eligibility decision, the technique of radiotherapy field setting and dose fractionation planning, the technique of irradiation, will be discussed. Students are encouraged to learn how to operate the radiotherapy planning system, to designate adequate radiotherapy plans for various clinical cases, and to evaluate the plans experimentally. They are also encouraged to participate in the clinical conferences to understand the role of radiation oncology as an important part of the multi-disciplinary cancer treatment
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, the degree of understanding of radiation oncology, their radiotherapy planning techniques acquired during the course and reports submitted for evaluation. The achievement criteria. 1) Understanding and knowledge of the principle and method of radiation oncology and the treatment procedure of radiotherapy. 2) Acquisition of radiotherapy planning techniques. 3) Proposal and execution of appropriate experimental radiotherapy planning. 4) Understanding of the practice of clinical radiotherapy.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22810)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Neuropsychiatry()	IKEDA Manabu, FUJISE Noboru, JONO Tadashi, HASHIMOTO Mamoru

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Group learning, presentation, discussion
Class objectives	The aim of this Departmental Course is to learn about procedure to evaluate psychiatric and behavioral symptoms of clinical cases of dementia and related disorders such as Alzheimer’s disease, neurosyphilis, carbon monoxide poisoning, encephalitis, Korsakoff syndrome and other organic psychiatric diseases. Further aim is to investigate procedure of research about relationship between psychiatric symptoms and cognitive impairments using neuropsychological techniques, to investigate appropriate method to identify neuronal bases of psychiatric and behavioral symptoms using neuroimaging techniques. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis and to present orally, are conducted in this Departmental Course.
Goals	
Class outline	
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of basic knowledge and being able to diagnose exactly and to evaluate symptoms in organic psychiatric disorders. 2) Acquisition of the newest knowledge and getting novel result in research theme about psychiatric and behavioral symptoms in organic psychiatric disorders. 3) Acquisition of the newest knowledge and getting novel result in clinical research by means of neuropsychological techniques and neuroimaging techniques. Acquisition of former knowledge with reference to research theme by learning about literatures, and making up and execution appropriate research plan.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22940)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Neuropsychiatry()	IKEDA Manabu, FUJISE Noboru, Jiyouno Tadashi, HASHIMOTO Mamoru

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Group learning, presentation, discussion
Class objectives	The aim of this Departmental Course is to learn about procedure to evaluate psychiatric and behavioral symptoms of clinical cases of dementia and related disorders such as Alzheimer’ s disease, neurosyphilis, carbon monoxide poisoning, encephalitis, Korsakoff syndrome and other organic psychiatric diseases. Further aim is to investigate procedure of research about relationship between psychiatric symptoms and cognitive impairments using neuropsychological techniques, to investigate appropriate method to identify neuronal bases of psychiatric and behavioral symptoms using neuroimaging techniques. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis and to present orally, are conducted in this Departmental Course.
Goals	
Class outline	
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of basic knowledge and being able to diagnose exactly and to evaluate symptoms in organic psychiatric disorders. 2) Acquisition of the newest knowledge and getting novel result in research theme about psychiatric and behavioral symptoms in organic psychiatric disorders. 3) Acquisition of the newest knowledge and getting novel result in clinical research by means of neuropsychological techniques and neuroimaging techniques. Acquisition of former knowledge with reference to research theme by learning about literatures, and making up and execution appropriate research plan.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25090)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Emergency and General Medicine(Emergency and General Medicine Departmental Course “Jissen” I)	Kasaoka Shunji

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face class lesson, Group learning
Class objectives	The aim of this Departmental Course is to learn how to practice emergency medicine and general medicine. In addition, students should learn the effective teaching methods of basic medical competence.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for emergency medicine and general medicine, and ability for interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis and to present orally, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of basic knowledge and teaching methods of emergency medicine and general medicine. 2) Acquisition of the newest knowledge and getting novel result in research theme about emergency medicine and general medicine. 3) Acquisition of former knowledge with reference to research theme by learning about literatures, and making up and execution appropriate research plan.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25100)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Emergency and General Medicine(Emergency and General Medicine Departmental Course “Jissen” II)	Kasaoka Shunji

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face class lesson, Group learning
Class objectives	The aim of this Departmental Course is to learn how to practice emergency medicine and general medicine, and to learn the effective teaching methods.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the department and academic meetings.
Class outline	All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis and to present orally, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of basic knowledge of emergency medicine and general medicine. 2) Acquisition of the newest knowledge and getting novel result in research theme about emergency medicine and general medicine.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21000)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Health Care Science()	SOEJIMA Hirofumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Hirofumi Soejima Program Schedule: year 1-4, every Tuesday (6th period) Site and Facilities: Health Care Center at Kurokami Campus
Class objectives	The aim of this course is to learn the receptivity of salt and sweetness and to learn mental psychological analysis to reveal response pattern for stress
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for health care science, and ability for study planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	It is well-known that lifestyle-related disease is caused by the changes of life environment factors such as aging, food, exercise, sleep, and stress. In this departmental course, students learn how the life environment factors including food, exercise, sleep, and stress is associated with lifestyle-related disease such as obesity, diabetes mellitus, hypertension, and hyperlipidemia. Then, students learn the receptivity of salt and sweetness that influence feeding, learn cardiopulmonary function or blood coagulation in case of decreased exercise function, and learn mental psychological analysis to reveal response pattern for stress to examine the fluctuation of physiology function and exercise function through life cycle.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of the latest knowledge about lifestyle-related disease and disease in youth. 2) Proposal of appropriate research projects on the basis of understanding the background on health care science and execution of the study.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21810)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Health Care Science()	SOEJIMA Hirofumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Hirofumi Soejima Program Schedule: year 1-4, every Thursday (6th - 7th period) Site and Facilities: Health Care Center at Kurokami Campus
Class objectives	students measure the receptivity of salt and sweetness
Goals	
Class outline	In this departmental course, students measure the receptivity of salt and sweetness that influence feeding, measure cardiopulmonary function or blood coagulation in case of decreased exercise function, perform mental psychological analysis to reveal response pattern for stress to examine the fluctuation of physiology function and exercise function through life cycle. Specific research projects to be executed should be determined by searching latest literatures related to the health medicine. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of the latest knowledge about life style related disease and disease in youth. 2) Logical/proper study design to prove the hypothesis about health care science . 3) Novel findings obtained by appropriate analytical approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20640)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Clinical Chemistry and Informatics()	IRIE Tetsumi, Ishitsuka Youichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tetsumi Irie, Yoichi Ishitsuka Program Schedule: year 1-4, every Friday (1st period) Site and Facilities: seminar room and laboratories at Department of Clinical Chemistry and Informatics
Class objectives	The aim of this Departmental Course is to learn how to select optimally the dosage form and the mode of drug administration based upon the drug information accumulated during the research and development of pharmaceuticals.
Goals	
Class outline	The aim of this Departmental Course is to learn how to select optimally the dosage form and the mode of drug administration based upon the drug information accumulated during the research and development of pharmaceuticals. In addition, the techniques for biostatistics and computer-based analysis are acquired during this Course. Since the therapeutic window is quite narrow in the medicine used by the newborn baby and the infant, population pharmacokinetic parameters for the medicine can be determined based on the therapeutic drug monitoring data. These parameters can be used for designing individualized dosage regimen for the neonate in clinical practice in order to overcome the problem of “therapeutic orphans”. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in scientific journals in the fields of pharmaceutical sciences, pharmaceutical technology, drug delivery system, therapeutic drug monitoring, clinical chemistry and/or informatics. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Proposal of appropriate research projects on the basis of understanding the background on the pharmaceutical sciences, clinical chemistry and informatics. 2) Understanding how to analyze pharmacokinetic/pharmacodynamic data and design the individualized dosage regimen for patients. 3) Logical/proper experimental design to optimal drug delivery system. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute not only to pharmaceutical sciences for the research and development of pharmaceutics but also to the optimal individualized dosage regimen for patients in clinical practices.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21450)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Clinical Chemistry and Informatics()	IRIE Tetsumi, Ishitsuka Youichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tetsumi Irie, Yoichi Ishitsuka Program Schedule: year 1-4, every Thursday (3rd-4th periods) Site and Facilities: seminar room and laboratories at Department of Microbiology
Class objectives	The aim of this class is to acquire the techniques to analyze the concentrations of drugs and their metabolites and various biomarkers in the biophases such as saliva, blood, urine, cerebrospinal fluid, bronchoalveolar lavage fluid, and various tissues.
Goals	
Class outline	The aim of this class is to acquire the techniques to analyze the concentrations of drugs and their metabolites and various biomarkers in the biophases such as saliva, blood, urine, cerebrospinal fluid, bronchoalveolar lavage fluid, and various tissues. Based on such quantitative and/or qualitative information, population pharmacokinetic parameters of the drugs can be determined and these parameters can be used for the designing of optimal and individualized drug dosage regimen in patients. In particular, experimental techniques to be earned in this course include establishment of experimental hypoxia models of animals, such as guinea-pigs and rats, and cultured cells, and analysis of various inflammatory mediators and signaling factors produced in cells and tissues. Particular emphasis is placed also on safe and proper use of drugs such as xanthines and doxapram administered to neonates with apnea.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to produce animal models for pulmonary injury and apnea. 2) Understanding how to detect and identify pro-inflammatory mediators and signaling factors, and determine their biological activities. 3) Acquisition of experimental techniques to determine the concentration of drugs and their metabolites and surrogate biomarkers for diseases in biophases and their implication. 4) Understanding of chemical reactivities, biological functions, identification/detection methods of reactive oxygen species and their impacts to pathogenesis.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20660)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Medical Information Sciences(Medical Information Sciences Departmental Course “Jissen” I (PhD Thesis Research))	USUKU Koichiro, Hirose Jiyun

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	Small group discussion and course reading.
Class objectives	The aim of this Departmental Course is to learn how to use the progress of information communication technology in the medical field, develop talented medical practitioners and find the usefulness of alternative medicine.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for medical informatics and communication technology, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the department and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	Research projects are mainly focused on learning basic technology and development of 1) an electronic medical record system that has various interfaces for entering medical records, 2) an suitable system for given disease susceptibility analysis, 3) database technology, internet technology, and eXtensible Markup Language and 4) a system that can evaluate clinical skills, effectiveness of alternative medicine and implement e-Learning system for educating medical practitioners and alternative medicine. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	Information is provided in the class.
Reading list	Information is provided in the class.
Information concerning enrollment	No prerequisite.
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Proposal of appropriate research projects on the basis of understanding the background on medical informatics 2) Logical/proper experimental design to identify the factors for progress in alternative medicine 3) Novel findings obtained by appropriate analytical approaches for educating medical practitioners 4) Innovative findings that can contribute not only to better understanding for medical informatics but to successful development of EHR system that is useful for education, research and medical practice

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21470)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Medical Information Sciences(Medical Information Sciences Departmental Course “Jissen” II (Experimental Technique Learning))	USUKU Koichiro, Hirose Jiyun

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	Experimental course to handle programs for medical informatics.
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the department and academic meetings.
Goals	To be able to properly handle information in the filed of medicine and to have ability to propose appropriate program for medical practice.
Class outline	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for medical informatics and communication technology, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the department and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Required Textbooks	Information is provided in the class.
Reading list	Information is provided in the class.
Information concerning enrollment	No prerequisite.
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to produce electronic health record systems 2) Understanding how to investigate problems in the field of disease susceptibility analysis 3) Acquisition of experimental techniques to identify the factors for progress in alternative medicine 4) Understanding of technique that is useful for developing databases and internet communication 5) Acquisition of suitable technique to investigate educational system for medical practitioners, alternative medicine and medical economy

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22230)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Physiological Function Assessment()	Nakamura Masaaki, sakamoto mineshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge regarding scientific information on recent progress in the research field, and their ability in experimental planning and interpretation of the results obtained. The presentation including discussion in the laboratory and academic meetings is also taken into consideration to assess the level of achievement in PhD research.
Goals	
Class outline	The rapid development of brain imaging methods during the last few decades has made it possible to understand the brain function better. The aim of this course is to learn about brain function, especially using magnetoencephalography (MEG). The risk of methylmercury exposure of the developing fetus brain is very high. We lecture about the mechanism of methylmercury (MeHg) transfer to the fetus via placenta, as well as distinct pattern of neuronal degeneration in the developing brain exposed to MeHg at various brain development phases, which provide important knowledge to evaluate the brain function.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Achievement will be evaluated according to the following criteria. Understanding and knowledge of the principles and approach of several brain imaging methods, along with newer results of research. Understanding of logical and proper experimental design to investigate use of brain imaging methods such as MEG. Understanding of MeHg transfer to fetus via placenta, and distinct pattern of neuronal degeneration in the developing brain exposes to methylmercury at various brain development phases. Understanding of the appropriate analysis method of the effects of methylmercury on brain function at different brain development phases and conducting the appropriate experimental design.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22240)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Physiological Function Assessment()	Nakamura Masaaki, Sakamoto mineshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge regarding scientific information on recent progress in the research field, and their ability in experimental planning and interpretation of the results obtained. The presentation including discussion in the laboratory and academic meetings is also taken into consideration to assess the level of achievement in PhD research.
Goals	
Class outline	The aim of this course is to learn the process of detection of a local region of injury or illness in the brain by analyzing sensory function by a practical case study using magnetoencephalography (MEG). We also lecture on methylmercury (MeHg) transfer to fetus via placenta, and the distinct pattern of neuronal degeneration in the developing exposure to MeHg at various brain development phases, which are important to evaluate the brain function of Minamata disease patients.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Achievement will be evaluated according to the following criteria. Understanding and knowledge of the principles and approach of several brain imaging methods along with newer research results written in English. Understanding of logical and proper experimental design to investigate use of brain imaging methods such as MEG. Understanding of the appropriate analysis method on the effects of methylmercury on brain function at different brain development phases and conducting the appropriate experimental design.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22730)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅰ : Advanced Cardiovascular Medicine()	Yasuda Satoshi, Anzai Toshihisa, Kusano Kengo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research, and the ability to design the study and interpretation and criticism of the results obtained. Presentation at the internal meetings and the report are taken into consideration to assess the level of achievement in the PhD research. Presentation at the scientific meetings and publication in the scientific journals are also evaluated as the PhD research.
Goals	
Class outline	The aim of this course is to learn how to propose scientific hypothesis for the pathogenesis of acute coronary syndrome (ACS). The clinical database of NCVC, such as patients backgrounds, MDCT and MRI findings, will be analyzed to investigate the novel predictors of the development of ACS. Furthermore, significant determinants of the post-infarction complications and left ventricular (LV) remodeling will be clarified. Especially, the role of post-infarction inflammation and immune response in LV remodeling will be investigated by collaboration with the National Bio bank established in NCVC. Instruction for presentation at the scientific meetings and publication in the peer-reviewed journals will be provided.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding the pathogenesis of ACS in relation to patients backgrounds. 2) Proposal of appropriate research projects regarding the predictors and pathophysiology of post-infarction complications. 3) Novel findings, regarding the determinants of LV remodeling, obtained by their own research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22750)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II ： Advanced Cardiovascular Medicine()	Yasuda Satoshi, Anzai Toshihisa, Kusano Kengo

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research, and the ability to design the study and interpretation and criticism of the results obtained. Presentation at the internal meetings and the report are taken into consideration to assess the level of achievement in the PhD research. Presentation at the scientific meetings and publication in the scientific journals are also evaluated as the PhD research.
Goals	
Class outline	The aim of this course is to learn molecular diagnosis for inherited arrhythmia syndromes, such as congenital long QT syndrome, Brugada syndrome, progressive cardiac conduction defect, catecholaminergic polymorphic ventricular tachycardia, and short QT syndrome. The genotype-phenotype correlation will be analyzed using multicenter database of those inherited arrhythmias to elucidate the genotype-specific pathogenesis, management and therapy. Functional analysis of the mutant channel using the whole-cell patch clamp technique or transgenic mouse model will be studied in this Departmental Course. Whole genome studies including exome to identify new candidate genes or modifier genes using next generation sequencer will be also studied.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Understanding of molecular diagnosis for inherited arrhythmia syndromes, such as congenital long QT syndrome, Brugada syndrome, progressive cardiac conduction defect, catecholaminergic polymorphic ventricular tachycardia. 2) Proposal of the genotype-specific pathogenesis, management and therapy by analyzing the genotype-phenotype correlation using multicenter database of those inherited arrhythmias. 3) Understanding of the functional analysis of the mutant channel using the whole-cell patch clamp technique or transgenic mouse. 4) Understanding of the whole genome studies including exome to identify new candidate genes or modifier genes using next generation sequencer.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20870)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Gastroenterological Surgery(Research Conducting Program "Practice" I : Gastroenterological	BABA Hideo, Yamashita Youichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Site and Facilities: seminar room and laboratories at Department of Gastroenterogical Surgery
Class objectives	To learn the mechanisms of the disease caused by the functional and morphologic disorder in digestive organ. Furthermore, advanced surgical care such as minimally invasive surgery for benign disease and muti-modal treatment (surgery, chemotherapy and radiotherapy) for cancer will also be addressed in this program.
Goals	【Course Description】 1. To understand the mechanisms of the disease caused by the functional and morphologic disorder in digestive organ. 2. To understand advanced surgical care such as minimally invasive surgery for benign disease and muti-modal treatment for cancer.
Class outline	The mechanisms of the disease caused by the functional and morphologic disorder in digestive organ will be addressed in this program. Furthermore, advanced surgical care such as minimally invasive surgery for benign disease and muti-modal treatment (surgery, chemotherapy and radiotherapy) for cancer will also be addressed in this program.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	【Evaluation for Grades and Credits】 Students are evaluated for credits based on their understanding and knowledge of gastroenterological surgery, and ability for experimental planning, interpretation and criticism of the results obtained. 【Evaluation Criteria】 1) Integrated knowledge of each disease of digestive surgery 2) Integrated knowledge of digestive surgery treatments for each diseases

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21680)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Gastroenterological Surgery(Research Conducting Program "Practice" II : Gastroenterological	BABA Hideo, Yamashita Youichi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Site and Facilities: seminar room and laboratories at Department of Gastroenterogical Surgery
Class objectives	The methodology for analysis of the factors related to carcinogenesis and digestive cancer development will be addressed in this program. Furthermore, the methodology for analysis of biological response to surgical invasiveness and inflammation will be shed light on. Specifically, the experimental skill to analyze the genes alternation in cancer tissues, develop the gene therapy, identify the cancer stem cells, investigate the expression of microRNA in cancer and clarify the mechanism of resistance of chemotherapy will be acquired in this program.
Goals	【Course Description】 1. To understand the methodology for analysis of the factors related to carcinogenesis and digestive cancer development. 2. To understand the methodology for analysis of biological response to surgical invasiveness and inflammation. 3. To understand the experimental skill to analyze the gene alternation of cancer, develop the gene therapy, identify the cancer stem cells, investigate the expression of microRNA in cancer and clarify the mechanism of resistance of chemotherapy.
Class outline	The methodology for analysis of the factors related to carcinogenesis and development of digestive cancer leading to the development of novel treatments will be addressed in this program. Furthermore, the methodology for analysis of biological response to surgical invasiveness and inflammation will be shed light on. Specifically, the experimental skill to analyze the gene alternation of cancer, develop the gene therapy, identify the cancer stem cells, investigate the expression of microRNA in cancer and clarify the mechanism of resistance of chemotherapy will be acquired in this program.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	【Evaluation for Grades and Credits】 Students are evaluated for credits based on their understanding and knowledge of gastroenterological surgery, and ability for experimental planning, interpretation and criticism of the results obtained. 【Evaluation Criteria】 1) Acquisition of experimental skills to analyze the factor related to carcinogenesis and development of digestive cancer using by clinical samples 2) Acquisition of experimental skill to detect the cancer specific genes

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20890)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Thoracic Surgery()	Suzuki Makoto

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	Recent advances of thoracic surgery depends on the following factors ----------
Goals	The achievement will be evaluated according to the following criteria. 1） Understanding of state of art thoracic surgery. 2） Novel findings obtained by appropriate and proper analytical approaches. 3） Inventing new therapy or diagnostic technology for thoracic surgery.
Class outline	1) innovation of diagnostic imaging, 2) developments of optical devices and operative instruments, 3) evolving techniques for segmentectomy. Summarize these advances and extract issues with thoracic surgery. Second, Search literatures related to the issue and determine specific research project. Finally, the experimental results or clinical trials should be reported in international specific journals. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this departmental course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for thoracic surgery, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21700)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Thoracic Surgery()	Suzuki Makoto

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.
Class outline	Summarize advances of thoracic surgery and extract problem of these. Learn how to search literature. Understand the meaning of statistics in clinical research. Learn elementary skills of gene and protein experiments.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1）Understanding state of art thoracic surgery. 2）Acquisition of literature search skill. 3）Understanding the statistical meaning in your data. 4）Acquisition of elementary skills of gene and protein experiments. 5）Contriving logical/proper experimental design.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20860)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Cardiovascular Surgery(Cardiovascular Surgery)	Fukui Toshihiro, Okamoto Ken

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	seminar room and laboratories at Department of Cardiovascular Surgery
Class objectives	The aim of this Departmental Course is to learn 1)new knowledge regarding diseases of the cardiovascular system, 2) recent surgical procedures for cardiovascular disease and 3) how to propose a new surgical procedure for cardiovascular disease.
Goals	Finally, the research progresses in the above-mentioned processes are necessary to fulfill requirements for PhD thesis, and reported by oral presentation.
Class outline	The aim of this Departmental Course is to learn 1)new knowledge regarding diseases of the cardiovascular system, 2) recent surgical procedures for cardiovascular disease and 3) how to propose a new surgical procedure for cardiovascular disease. The hypothesis must then be proven experimentally. Latest literatures, for example, regarding blood flow disturvance, cardiac dysfunction, angiogenesis, and tissue regeneration are searched. Experimental design will be constructed to develop a novel approach for therapeutic angiogenesis and myocardial regeneration using angiogenic growth factors and various stem cells. Finally, the experimental results should be reported in international scientific journals in the fields of cardiovascular medicine, cardiovascular surgery, regenerative medicine. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding of latest knowledge regarding cardiovascular system and disease. 2) Understanding of physiological and molecular mechanisms for angiogenesis or tissue regeneration in cardiovascular system. 3) Proposal of appropriate research projects on the basis of understanding the cardiovascular abnormality. 4) Novel findings obtained by appropriate and proper analytical approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21670)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cardiovascular Surgery(Cardiovascular Surgery)	Fukui Toshihiro, Okamoto Ken

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	seminar room and laboratories at Department of Cardiovascular Surgery
Class objectives	The aim of this class is to acquire the techniques to analyze cardiovascular system and abnormalities.
Goals	Finally, the research progresses in the above-mentioned processes are necessary to fulfill requirements for PhD thesis, and reported by oral presentation.
Class outline	The aim of this class is to acquire the techniques to analyze cardiovascular system and abnormalities. Specifically, experimental techniques to be earned in this course include establishment of experimental models of animals including rat, mouse and dog, vascular anastomosis technique, angiogenic therapy and analysis of molecular markers. Advanced techniques to investigate angiogenesis or myocardial regeneration will be thoroughly studied in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to produce animal models for myocardial ischemia or leg ischemia. 2) Acquisition of experimental skills to anastomose vessels and to produce angiogenesis. 3) Acquisition of experimental techniques to culture progenitor cells for angiogenesis or myogenesis. 4) Understanding of physiological and molecular mechanism of angiogenesis or myogenesis. 5) Experimental protocol for angiogenesis or myogenesis.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20910)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Breast and Endocrine Surgery(1. Study of endocrine responsiveness in breast cancer, 2. Predictive and prognostic factors in breast cancer)	IWASE Hirotaka, YAMAMOTO Yutaka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	face-to-face class lesson, group learning, e-learning
Class objectives	The evaluation of each person will be supported by each theme according to below points. 1. The clinical usefulness of prognostic and predictive factors for breast cancer treatment, especially for advanced/recurrent breast cancer will be discussed according to clinical research of patient's outcome. 2. The signal transduction of breast cancer growth, especially endocrine-dependent growth, will be discussed and the new treatment strategies for advanced breast will be analyzed. 3. The conventional knowledge related to the study theme will be discussed in the literature and practical research work. Appropriate experimental plan will be given to carry out the theme.
Goals	The evaluation of each person will be supported by each theme according to below points. 1. The clinical usefulness of prognostic and predictive factors for breast cancer treatment, especially for advanced/recurrent breast cancer will be discussed according to clinical research of patient's outcome. 2. The signal transduction of breast cancer growth, especially endocrine-dependent growth, will be discussed and the new treatment strategies for advanced breast will be analyzed. 3. The conventional knowledge related to the study theme will be discussed in the literature and practical research work. Appropriate experimental plan will be given to carry out the theme. 4. The action and dysfunction of the endocrine organs, such as thyroid, parathyroid, adrenal grand will be reported. 5. About the fundamental knowledge and the achievements related to the study theme, your documents will be published in English Journals.
Class outline	Surgical management and muti-modal treatment for the endocrine-related cancers or tumors, such as breast cancer, thyroid cancer, and other functional tumors, such as, parathyroid adenoma or hyperplasia with MEN (multiple endocrine neoplasia) and the functional tumors of adrenal gland, will be addressed in this practical series. Furthermore, the multimodal management of advanced cancer/recurrence breast cancer including chemotherapy, endocrine therapy and molecular targeting therapy will be discussed. In addition, the fundamental research works, such as the analyses of machanism of breast cancer growth, especially estrogen dependent growth, and other genetic or serum markers for monitoring or predicting factors of breast cancer treatment, will be conducted by the instructors. The above-mentioned results of research will be published in an article and presented.
Required Textbooks	
Reading list	
Information concerning enrollment	Have earned credits in Research Conducting Program "Practice" I : Breast and Endocrine Surgery
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries or the final reports.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21720)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Breast and Endocrine Surgery(Research Conducting Program "Practice" II : Breast and Endocrine Surgery 1. Study of endocrine responsiveness in breast cancer,	IWASE Hirotaka, YAMAMOTO Yutaka

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	face-to-face class lesson, group learning, e-learning
Class objectives	The evaluation of each person will be supported by each theme according to below points. 1. The clinical usefulness of prognostic and predictive factors for breast cancer treatment, especially for advanced/recurrent breast cancer will be discussed according to clinical research of patient’s outcome. 2. The signal transduction of breast cancer growth, especially endocrine-dependent growth, will be discussed and the new treatment strategies for advanced breast will be analyzed. 3. The conventional knowledge related to the study theme will be discussed in the literature and practical research work. Appropriate experimental plan will be given to carry out the theme.
Goals	The evaluation of each person will be supported by each theme according to below points. 1. The clinical usefulness of prognostic and predictive factors for breast cancer treatment, especially for advanced/recurrent breast cancer will be discussed according to clinical research of patient’s outcome. 2. The signal transduction of breast cancer growth, especially endocrine-dependent growth, will be discussed and the new treatment strategies for advanced breast will be analyzed. 3. The conventional knowledge related to the study theme will be discussed in the literature and practical research work. Appropriate experimental plan will be given to carry out the theme. 4. The action and dysfunction of the endocrine organs, such as thyroid, parathyroid, adrenal grand will be reported. 5. About the fundamental knowledge and the achievements related to the study theme, your documents will be published in English Journals.
Class outline	Surgical management and muti-modal treatment for the endocrine-related cancers or tumors, such as breast cancer, thyroid cancer, and other functional tumors, such as, parathyroid adenoma or hyperplasia with MEN (multiple endocrine neoplasia) and the functional tumors of adrenal gland, will be addressed in this practical series. Furthermore, the multimodal management of advanced cancer/recurrence breast cancer including chemotherapy, endocrine therapy and molecular targeting therapy will be discussed. In addition, the fundamental research works, such as the analyses of machanism of breast cancer growth, especially estrogen dependent growth, and other genetic or serum markers for monitoring or predicting factors of breast cancer treatment, will be conducted by the instructors. The above-mentioned results of research will be published in an article and presented.
Required Textbooks	
Reading list	
Information concerning enrollment	Have earned credits in Research Conducting Program "Practice" I : Breast and Endocrine Surgery
Assessment methods and criteria/ratios	ing will be based on active class participation, paper summaries or the final reports

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22880)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Pediatric Surgery and Transplantation(Practice of Pediatric Surgery and Transplantation Surgery)	INOMATA Yukihiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Period of the course and the class: From 1st to 4th grade, in whole year, in the afternoon of Thursday and Friday. Place of the class: in the offices and labs of the department of Pediatric Surgery and Transplantation, in addition to the facilities of the University Hospital
Class objectives	To find the problems and improve the outcome of treatment in the pediatric surgery and transplantation
Goals	To find the problems and their resolutions in the field of the pediatric surgery and transplantation surgery. They should be presented or published.
Class outline	Practices of genomic analysis, epidemiological studies, making a model animals, to be used in the discovery of pathogenesis and in the development of new treatment modalities in the field of pediatric surgery, especially in congenital anomalies. These are learned in the process of reading, focusing on the making a study design, method of the study, and finalizing the conclusion. In the field of the transplantation surgery, history and the current status of living donor liver transplantation (LDLT) will be studied by reading the relating articles. The study will be focused on how the LDLT has been developed, how it has been expanded from pediatric to adults, problems of indications, and evolutions for immunosuppression. The students will be instructed for the oral presentation and the writing of manuscripts on the outcome of their studies.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	General assessment of written reports and oral presentations about the research theme of each student. How the students recognize the related article or book chapters and how they planned their study and obtained the results are focussed. Published articles written by the students, oral presentations in some academic meetings, and presentations in the routine meetings in the department are all included in the material for assessment.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(23010)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Pediatric Surgery and Transplantation(Practice" II : Pediatric Surgery and Transplantation)	INOMATA Yukihiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	In seminar rooms and labs of department of pediatric surgery and transplantation
Class objectives	Learning of the study skills for the research work to resolve the problems in the field of pediatric surgery and transplantation
Goals	Obtaining the study skill and conducting oral presentations, writing articles related to the targeted theme.
Class outline	Analysis of clinical pathology, disease-related venom analysis, practice for animal study, to make an rat model for liver transplantation, study about the clinical use of immunosuppressants, analysis of immune-competent cells in the field of liver transplantation, genomic and proteomic analysis in the regulation of peri- transplant periods, and so on.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Experimental skill and the ability for presentation will be assessed. Written articles, oral presentation is the scientific meetings, and the progress repots in the regular intra-departmental meeting will be also assessed.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20920)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Neurosurgery(Research conducting program "Practice"I:Neurousurgery)	YANO Shigetoshi, NAKAMURA Hideo, MAKINO Keishi, HIDE Takuichiro, KAWANO Takayuki, SHINOJIMA Naoki, OHMORI Yuki, NAKAGAWA Takashi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	searching and reading of scientific papers, planing and performing research on the specific theme, writing the paper practice place; the laboratory in the Department of Neurosurgery
Class objectives	Course 1: The aim of this course is to teach the mechanisms underlying the molecular pathogenesis of malignant brain tumors. Course 2: This course teaches the mechanisms underlying the development of cerebral aneurysms, the molecular biology of moyamoya disease, and genetic abnormalities found in congenital anomalies of the central nervous system.
Goals	Students will receive course grades and credits based on the course hours completed, their understanding and knowledge of course material, and their comprehension of scientific information and recent progress made in brain tumor treatment. Current molecular-targeting therapies, new-generation of chemotherapy, and interventional neurosurgery are topics to be understood.
Class outline	Course 1: An understanding of the molecular mechanisms of tumorigenesis such as mutation of the p53 gene and IDH1/2, methylation of the promoter region of the MGMT gene, EGFR amplification and chromosome 1p/19q deletion will be gained. The correlation between these gene mutations and prognosis, and the role of chemokines such as MCP-1 in tumorigenesis will be addressed. A solid understanding of tumor immunology will be acquired. Course 2: An understanding of he mechanisms underlying the development of cerebral aneurysms, the molecular biology of moyamoya disease, and genetic abnormalities found in congenital anomalies of the central nervous system.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	evaluation of reports Course 1: 1. An understanding of the role of molecular pathogenesis such as p53 mutation, IDH1/2 mutation and chromosome 1p/19q deletion 2. An understanding of the mechanisms of gene modification such as methylation and amplification 3. An understanding of the role of chemokines produced by the brain tumor Course 2: 1. An understanding of the mechanisms underlying the development of cerebral aneurysms 2. An understanding of the molecular biology of moyamoya disease 3. An understanding of genetic abnormalities in congenital anomalies of the central nervous system

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21730)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Neurosurgery(Research conducting program "Practice" II: Neurosurgery)	YANO Shigetoshi, NAKAMURA Hideo, MAKINO Keishi, HIDE Takuichiro, KAWANO Takayuki, SHINOJIMA Naoki, OHMORI Yuki, NAKAGAWA Takashi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	searching and reading of scientific papers, planing and performing research on the specific theme, writing the paper practice place: the laboratory in the Department of Neurosurgery
Class objectives	Course 1: The aim of this course is to teach techniques for the analysis of gene mutations related to glioma. Course 2: The aim of this course is to teach techniques for the development of animal models of transient ischemia. Differences between necrosis and apoptosis after transient ischemic changes are studied.
Goals	Students will receive course grades and credits based on the course hours completed and their understanding and knowledge of course material, such as techniques for the analysis of gene mutations and the development of animal models.
Class outline	Course 1: The preparation of DNA and mRNA from cell lines and tissue specimens will be taught. In addition, students will learn how to (1) analyze gene sequences based on PCR assay of the p53 and IDH1, (2) analyze gene methylation based on methylation specific PCR for the MGMT, (3) analyze gene amplification of EGFR and chromosome 1p/19 deletion based on FISH assay. Experimental techniques taught in this course include Western blotting, immunohistochemistry, and in situ hybridization. Course 2: The model induces transient occlusion of the rat middle cerebral artery. The rats are decapitated immediately after reperfusion or at selected times thereafter. Differences between necrosis and apoptosis after transient ischemic changes are studied. The intracellular signal pathway are examined immunohistochemically and the mechanisms underlying the activation of precursor neural cells or neural stem cells by neurotrophic factors, and neural regeneration therapy are studied.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	evaluation of reports and presentation on the scientific meeting Course 1: 1. An understanding of preparation of DNA and mRNA from cell lines and tissue specimens 2. An understanding of PCR assay and DNA sequences 3. An understanding of methylation specific PCR, FISH,Western blotting, immunohistochemistry, and in situ hybridization Course 2: 1. The ability to generate the animal model of transient ischemia 2. An understanding of differentiate between necrosis and apoptosis 3. An understanding of the activating mechanisms of precursor neural cells or neural stem cells by neurotropic factors

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22850)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Orthopaedic()	MIZUTA Hiroshi, Ide Jiyunji, NAKAMURA Eiichi, Fujimoto Tooru

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and exercise in the seminar room of orthopedic surgery in the 6th class on Monday
Class objectives	Orthopedic surgery deals with diseases and injuries to the motor system. The motor system includes organs that support and help in body movement and includes the bones, joints, ligaments, spinal cord, nerves, muscles, and vessels. The purpose of this lecture is to teach about the current situation and problems on musculoskeletal disease in clinical and basic research by referring to the literature and provide instructions on the methodology for research on this topic.
Goals	Ability to plan basic or clinical studies for elucidating the pathology, clinical verification of diagnosis, development of treatment strategies, and the prevention for musculoskeletal disease.
Class outline	With a focus on molecular mechanisms regulating the destruction and repair of musculoskeletal tissues, basic research aimed at the regeneration of musculoskeletal tissues, and molecular genetic approaches to musculoskeletal disease, we will introduce recent advances in basic research in these fields. We will teach how to arrive at the hypothesis for individual studies and the testing thereof. In addition, we will discuss specific cases from the literature and provide instructions on the study design and methodology necessary for elucidating the etiology and pathology, clinical verification of diagnosis, development of treatment strategies, and prevention approach for musculoskeletal disease. We will also provide instructions on the methods to be used for summarizing the results of such studies in reports and oral presentations.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated on the basis of their ability to understand and analyze books and papers related to their research topic as well as reports and oral presentations. They will also be evaluated on the basis of their ability to plan basic or clinical studies. The evaluations will focus on the following areas for each research project. 1) Newest knowledge of the basic research. 2) Newest knowledge of the clinical research. 3) Knowledge of the results of earlier literature and ability to plan an appropriate study design.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22980)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Orthopaedic()	MIZUTA Hiroshi, Ide Jiyunji, NAKAMURA Eiichi, Fujimoto Tooru

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Lecture and exercise in the seminar room of orthopedic surgery in the 6th and 7th class on Tuesday
Class objectives	We teach experimental procedures of histology, biochemistry, and molecular biology using animal models and cultured cells acquire to impart knowledge on clinical research. The purpose of this lecture and exercise was to elucidate the etiology and pathology, prove clinical diagnosis, and develop strategies for prevention or treatment of musculoskeletal diseases, using the basic or advanced methodology for clinical research.
Goals	Knowledge gained on the methodology for basic or advanced clinical research. Establishing novel findings to elucidate the etiology and pathology, prove clinical diagnosis, and develop strategies for treatment or prevention of musculoskeletal disease using the basic or advanced methodology for clinical research.
Class outline	We provide instructions on the experimental procedures of histology, biochemistry, and molecular biology using the animal models and cultured cells acquired for research on musculoskeletal disease. For example, we provide instructions on the basic experimental procedures performed on animals, as well as procedures of cell culture, tissue preparation, histology, biochemistry, molecular biology, electron microscopy, and immunology. In addition, we teach designing of studies and methodology planning for advanced research, solving ethical issues, as well as obtaining medical statistics. Using these experimental skills and techniques as well as an appropriate study design and methodology for clinical research on musculoskeletal disease, we provide instructions to the students on the approach for summarizing their results in written reports and oral presentations.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated on the basis of experimental and technical skills gained for their research and reports. Students may substitute accepted research papers, conference presentations, or progress reports in laboratory meetings for these reports. The evaluations will focus on the following areas for each research project. 1) Experimental and technical skills gained for basic research on musculoskeletal disease. 2) Knowledge gained regarding the methodology for clinical research. 3) Planning and execution of appropriate methodologies and study designs to solve research problems and obtaining novel findings in the research project.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22580)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Obstetrics and Gynecology(structure and function, dysfunction of human placenta)	KATABUCHI Hidetaka, Ooba Takashi, HONDA Ritsuo, TASHIRO Hironori, OKAMURA Yoshinori

Goals with their ratio
Under construction ‥‥100%

Type of Class	Lecture
Teaching Method	Supervisor: Hidetaka Katabuchi, Takashi Ohba, Hironori Tashiro, Ritsuo Honda, Yoshinori Okamura Program Schedule: year 1-4 Site and Facilities: seminar room and laboratories at Department of Obstetric and Gynecology
Course Goals	The aim of this Departmental Course is ; To learn how to propose scientific hypothesis for the mechanisms of cellular function in human placenta, and identification of the protein(s) maintain cross talk between the cells that control human placental function. To learn how to propose scientific hypothesis for the carcinogenesis in gynecologic cancers including precancerous lesions (e.g. endometriosis), and to verify the hypothesis using the technique in molecular biology and pathology.
Course Achievement Targets	The achievement will be evaluated according to the following criteria. Obstetrics : 1) Proposal of appropriate research projects on the basis of understanding the background on the placental physiology and pathology. 2) Proposal of appropriate research projects on the basis of understanding the background on the physiological role of placental macrophage. 3) Original and innovative findings that can contribute not only to better understanding for microbial pathogenesis and host defense but also to successful development of diagnosis, prevention, and treatment of various diseases. Gynecology : 1) Proposal of appropriate research projects on the basis of understanding the background on the normal ovarian and endometrial physiology. 2) Proposal of appropriate research projects on the improvement of understanding the ovarian and endometrial carcinogenesis. 3) Logical and proper experimental design to identify the pathogenic and host defense factors. 4) Original and innovative findings that can contribute not only to better understanding for pathogenesis but also to successful development of diagnosis, prevention, and treatment of ovarian and endometrial carcinomas.
Outline	Obstetrics : Experimental design will be constructed to develop a novel approach to identify the molecules for recognition and degradation of placental human chorionic gonadotropin (hCG). Further studies will be constructed to study the distribution and function of the molecules, and the correlation with clinical findings. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of Reproductive Physiology, Biology and/or Endocrinology. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course. Gynecology: Experimental design will be constructed to develop a novel approach to identify using human tissue-materials and immortalized human ovarian surface epithelial cells in ovarian carcinogenesis, and using recombinant mice having murine PTEN mutation in endometrial carcinogenesis. Further studies will be constructed to study the distribution and function of the molecules, and the correlation with clinical findings. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of Gynecology. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Textbooks/Materials	not specified
Reading List	not specified
Enrollment Prerequisites	
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for recognition and degradation of placental gonadotropins, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22700)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Obstetrics and Gynecology(Human in vitro fertilization and embryo transfer (IVF-ET).)	KATABUCHI Hidetaka, Ooba Takashi, HONDA Ritsuo, TASHIRO Hironori, OKAMURA Yoshinori

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Hidetaka Katabuchi, Takashi Ohba, Hironori Tashiro, Ritsuo Honda, Yoshinori Okamura Program Schedule: year 1-4 Site and Facilities: seminar room and laboratories at Department of Obstetric and Gynecology
Class objectives	Obstetrics：The aim of this class is to acquire the techniques to perform human in vitro fertilization and embryo transfer (IVF-ET). Gynecology：The aim of this class is to acquire the techniques to perform the research.
Goals	The achievement will be evaluated according to the following criteria. Obstetrics： 1) Proposal of appropriate research projects on the basis of understanding the background of IVF-ET program. 2) Logical / proper experimental design to improve the oocyte / embryo quality. 3) Novel findings obtained by appropriate and proper analytical approaches to improve the microenvironment of oocyte / embryo culture including co-culture system using human immortalized cell lines. Gynecology： 1) Understanding how to culture cells and to breed animals. 2) Acquisition of experimental skills to analyze immunohistochemistry and molecular biology, to culture cells and to produce animal models for the gynecologic cancers or its precancerous lesions. 3) Acquisition of experimental techniques to analyze various factors including immune system (e.g., macrophage).
Class outline	Obstetrics：Experimental techniques to be earned in this course include the incubation of gametes / embryo, insemination, quality estimation and transfer of the embryo using experimental animals, such as mice. Particular emphasis is placed also on the establishment of co-culture system of embryo with feeder cell layer, intracytoplasmic sperm injection (ICSI). The students are also encouraged to take the embryologist’ s licenses. All of above will be thoroughly studied in this Departmental Course. Gynecology：Experimental techniques to be earned in this course include establishment of experimental models of animals and cultured cells, and analysis of various factors and host immune system. Particular emphasis is placed also on the establishment of culture system using immortalized human ovarian surface epithelial cells and/or macrophages, and the establishment of recombinant mice model, and advanced techniques of immunohistochemistry and molecular biology. All of above will be thoroughly studied in this Departmental Course.
Required Textbooks	not specified
Reading list	not specified
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for IVF-ET, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22820)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Urology( )	Kawano Yoshiaki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face lecture and practice
Class objectives	Participants are expected to learn essential experimental knowledge and procedures for study on urological cancers. They are also expected to learn how to plan experiments by themselves for their research projects and to write papers.
Goals	Participants are expected to independently plan and perform experiments, interpret results, write papers and give presentations.
Class outline	As exemplified by cytokine therapy for renal cell carcinoma, BCG bladder instillation therapy for bladder cancer, and peptide vaccine therapy for prostate cancer, immunotherapy primarily tends to be effective against urological cancers. Although cancer treatment is now reaching a major turning point due to the emergence of molecular targeted drugs, actual response rate of those drugs falls below the outcome of clinical trials, and these drugs are far from being “miracle remedies” as it turns out they actually possess various problems including adverse effects. Therefore, to tackle those issues, course participants will establish multi-disciplinary therapy models including immunotherapy by using mouse models for urological cancers and analyzing the antitumor effects and immunological parameters with guidance by supervisors. Based on these research results, the participants will also be provided a guide on how to write research papers and give oral presentations.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grades will be awarded depending on experimental techniques acquired by the participants. Course reports can be substituted by academic articles, presentations at academic meetings or progress reports at journal clubs or lab meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22950)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Urology( )	Kawano Yoshiaki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Face-to-face lecture and practice
Class objectives	Participants are expected to learn essential experimental knowledge and procedures for study on urological cancers. They are also expected to learn how to plan experiments by themselves for their research projects and to write papers.
Goals	Participants are expected to independently plan and perform experiments, interpret results, write papers and give presentations.
Class outline	As exemplified by cytokine therapy for renal cell carcinoma, BCG bladder instillation therapy for bladder cancer, and peptide vaccine therapy for prostate cancer, immunotherapy primarily tends to be effective against urological cancers. Although cancer treatment is now reaching a major turning point due to the emergence of molecular targeted drugs, actual response rate of those drugs falls below the outcome of clinical trials, and these drugs are far from being “miracle remedies” as it turns out they actually possess various problems including adverse effects. Therefore, to tackle those issues, course participants will establish multi-disciplinary therapy models including immunotherapy by using mouse models for urological cancers and analyzing the antitumor effects and immunological parameters with guidance by supervisors. Based on these research results, the participants will also be provided a guide on how to write research papers and give oral presentations.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grades will be awarded depending on experimental techniques acquired by the participants. Course reports can be substituted by academic articles, presentations at academic meetings or progress reports at journal clubs or lab meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22830)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Ophthalmology(Ophthalmology, Departmental Course “Jissen” I)	TANIHARA Hidenobu, Inoue Toshihiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Lectures, Group meeting
Class objectives	On the basis of the results obtained, further experimental design will be constructed to develop a novel approach. Finally, the experimental results should be reported in international scientific journals in the fields of microbiology, biochemistry, molecular biology, cell biology, and/or infectious diseases.
Goals	1) Understanding how to investigate molecular pathogenesis for ocular blindness diseases. 2) Proposal of appropriate research projects on the basis of understanding the background on the molecular mechanisms relevant to visual-threatening diseases. 3) Logical/proper experimental design to identify the pathogenic factors. 4) Novel findings obtained by appropriate and proper analytical approaches.
Class outline	Since two major blindness disease including retinal diseases (diabetic retinopathy, age-related macular degeneration (AMD), etc) and glaucoma are caused by retinal cell death, neuro-protection and neuro -regeneration as a new strategies are needed. The aim of this Departmental Course is to learn how to investigate the mechanisms of molecular pathogenesis of these ocular diseases. We aim to demonstrate that how several molecules associated with cell death, neuro-protection and neuro-regeneration change its expression, by using some animal models of ocular disease such as glaucoma, ischemic-reperfusion, AMD.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for molecular pathogenesis of ocular disease, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22960)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Ophthalmology()	TANIHARA Hidenobu, Inoue Toshihiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	Lectures and group meetings
Class objectives	The aim of this class is to acquire the techniques to analyze the molecular biology to various ocular diseases.
Goals	1) Acquisition of experimental skills to extract DNA and RNA from serum. 2) Understanding the principle and method of PCR. 3) Understanding of analyzing gene expression by use of RT-PCR, northern blotting and in situ hybridization. 4) Novel findings obtained by appropriate and proper analytical approaches.
Class outline	Experimental techniques to be earned in this course include establishment of experimental models of animals, such as mice and rats, and cultured cells, and analysis of various signaling factors and molecules produced in cells and tissues. Particular emphasis is placed also on safe and proper handling of various pathogens (culture methods etc.), analytical methods for gene expression (RT-PCR, Northern blotting, in situ hybridization, etc), all of which will be thoroughly studied in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student' s presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22840)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Otolaryngology-Head and Neck Surgery()	Sanuki Tetsuji

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	We conduct the course according to the number of attendees.
Class objectives	To analyze the process of nerve regeneration on the site of nerve injury and nucleus ambiguous from the view point of expression and function of neurotrophic factors, using animal models in which the recurrent laryngeal nerve was given various degrees of injury, through use of the electron microscope, immunohistology and molecular biology.
Goals	To gain an understanding of the degeneration and regeneration processes of motor nerve fibers. To examine the recovery of the regenerating nerve fiber after administration of neurotrophic factor.
Class outline	As the recurrent laryngeal nerve is mainly consisted of motor nerve fibers, the ability for recovery should be high when it is injured. However, the function of injured recurrent laryngeal nerves is rarely recovered completely. Regeneration of relatively thick nerves such as the sciatic nerve and facial nerve has been studied before, but that of the recurrent laryngeal nerve has not been examined. We previously found and reported that some neurotrophic factors facilitate the regeneration of the recurrent laryngeal nerve, and that the effects of the neurotrophic factors on the nerve regeneration are different by the degree of the nerve injury. In this subject, To analyze the process of nerve regeneration on the site of nerve injury and nucleus ambiguous from the view point of expression and function of neurotrophic factors, using animal models in which the recurrent laryngeal nerve was given various degree of injury, applying the technique of electron microscope, immunohistology and molecular biology. To examine the recovery of the regenerating process in case a neurotrophic factor is administered.
Required Textbooks	No Textbook is specified; handouts to be distributed.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. Students may also be required to publish or present research related to material covered in this course.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22970)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Otolaryngology-Head and Neck Surgery()	Minoda Ryosei

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	We contact it by the number of the student attending a lectures appropriately.
Class objectives	You will learn about; Pathophysiology of profound hearing loss. Treatment strategy of profound hearing loss. Up-to-date information of basic research of sensorineural hearing loss. You will conduct basic research into possible methods and mechanism for curing the sensorineural hearing loss.
Goals	You will understand pathophysiology and basic research of sensorineural hearing loss. Through the basic research, you will find a new method and/or mechanism for treating the sensorineural hearing loss.
Class outline	Hearing loss is induced by various causes such as aging, noise, viral infection. It is believed that hair cell regeneration once disappeared was impossible. However, recently we proved that hair cells regenerate if we over-express atho1 gene in cochlea utilizing adenovirus vector, which is important for hair cell generation in embryonic stage. ① We will train handling technique and breeding technique of guinea pigs, rats and mouse, and tissue preparation technique of vestibular organs and cochleae. ② We will train ex-vivo organ culture and gene transfer by electroporation.
Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by attendance rate, oral presentations and repots regarding planning of a research and results of a research. A published own papers and a presentation in a meeting will be utilized for the evaluation instead of the reports if they want. Students whose attendance rates are over 2/3 can take examination by a report. The reports will be revaluated for the following items; 1)Understanding of handling of small animals and guideline of animal experiments. 2)Understanding of surface preparation technique. 3)Understanding of cells cultures and organ cultures. 4)Understanding of gene transfer technique.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22860)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Oral and Maxillofacial Surgery(Elucidation of the mechanisms of radioresistance in oral squamous cell carcinoma)	NAKAYAMA Hideki, YOSHIDA Ryoji

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	face-to-face class
Class objectives	To understand the clinical impact of radioresistance in the treatment of OSCC patients. To understand the basic mechanisms of radioresistance of OSCC cells.
Goals	To explain the clinical impact of radioresistance in the treatment of OSCC patients. To explain the characteristics of radioresistant OSCC cells.
Class outline	The students who take this course will learn the way of analyzing of radioresistant OSCC cells, resulting in understanding the characteristics of radioresistant OSCC cells.
Required Textbooks	
Reading list	Kuwahara et al. Clinically relevant radioresistant cells efficiently repair DNA double-strand breaks induced by X-rays. Cancer Sci. 100(4):747-52, 2009 Kuwahara et al. The modified high-density survival assay is the useful tool to predict the effectiveness of fractionated radiation exposure. J Radiat Res. 51(3):297-302, 2010
Information concerning enrollment	The students have to possess a basic knowledge of cancer biology.
Assessment methods and criteria/ratios	We will assess the student's comprehension by the reports. The students have to attends the lectures more than 75%.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22990)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Oral and Maxillofacial Surgery(Elucidation of the mechanisms of metastasis in oral squamous cell	NAKAYAMA Hideki, YOSHIDA Ryoji

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	face-to-face class
Class objectives	To understand the clinical impact of metastasis in the treatment of OSCC patients. To understand the basic mechanisms of metastasis of OSCC cells.
Goals	To explain the clinical impact of metastasis in the treatment of OSCC patients. To explain the characteristics of metastatic OSCC cells.
Class outline	The students who take this course will learn the way of analyzing of highly metastatic OSCC cells, resulting in understanding the characteristics of highly metastatic OSCC cells.
Required Textbooks	
Reading list	Nakamura T, Shinriki S, Jono H, Guo J, Ueda M, Hayashi M, Yamashita S, Zijlstra A, Nakayama H, Hiraki A, Shinohara M, Ando Y. Intrinsic TGF-β 2-triggered SDF-1-CXCR4 signaling axis is crucial for drug resistance and a slow-cycling state in bone marrow-disseminated tumor cells. Oncotarget 6(2):1008-19, 2015 Tanaka T, Nakayama H, Yoshitake Y, Irie A, Nagata M, Kawahara K, Takamune Y, Yoshida R, Nakagawa Y, Ogi H, Shinriki S, Ota K, Hiraki A, Ikebe T, Nishimura Y, Shinohara M. Selective inhibition of nuclear factor-κB by nuclear factor-κB essential modulator-binding domain peptide suppresses the metastasis of highly metastatic oral squamous cell carcinoma. Cancer Sci. 103(3):455-63, 2012
Information concerning enrollment	The students have to possess a basic knowledge of cancer biology.
Assessment methods and criteria/ratios	We will assess the student's comprehension by the reports. The students have to attends the lectures more than 75%.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22570)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Dermatology and Plastic Surgery(Research Conducting Program "Practice" I : Dermatology and Plastic Surgery)	In Hironobu, Jinnin Masatoshi, Fukushima Satoshi, Masuguchi Shinichi, Makino Takamitsu, Igata Toshikatsu, Ichihara Asako, Miyashita Azusa, Kajihara Ikko, Aoi Jun, Fujisawa Akihiko, Niimori Daisuke, Honda Noritoshi, Kudo Hideo.

Goals with their ratio	
Under construction ・・・・100%	
Type of Class	Lecture
Teaching Method	Lecture, reading papers
Course Goals	The experimental results should be reported in scientific journals in the field of Dermatology.----------
Course Achievement Targets	Inflammatory skin diseases and skin tumors, including the epidemiological approach----------
Outline	The aim of this Departmental Course is to learn how to collect information for experiments about inflammatory skin diseases and skin tumors, including the epidemiological approach. On the basis of the results obtained, we will discuss the problems and design experimental procedures. Furthermore, we will develop a novel approach for the defense mechanism, aging and carcinogenesis of skin, by using the ultraviolet irradiation model mouse. In addition, pathological, biochemical, and molecular biological techniques will be studied to analyze the changes in the skin condition of some inflammatory diseases and tumors. Finally, the experimental results should be reported in scientific journals in the field of Dermatology.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The report evaluates the following items. 1) The latest knowledge of inflammatory skin diseases and the skin tumors is acquired, and novel results are obtained. 2) A molecular biological technique for analyzing the appearance of disease mechanism of the skin disorder is understood. 3) Method of a pathology and molecular biology experiments concerning the skin defense mechanism has been acquired. 4) An appropriate research topic is set for the skin disease defense mechanism or the carcinogenesis mechanism. 5) Knowledge related to the set research topic is acquired by the student, and an appropriate design of experiment is planned and executed.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22690)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Dermatology and Plastic Surgery(Research Conducting Program "Practice" II : Dermatology and Plastic Surgery)	In Hironobu, Jinnin Masatoshi, Fukushima Satoshi, Masuguchi Shinichi, Makino Takamitsu, Igata Toshikatsu, Ichihara Asako, Miyashita Azusa, Kajihara Ikko, Aoi Jun, Fujisawa Akihiko, Niimori Daisuke, Honda Noritoshi, Kudo Hideo.

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Lecture, reading papers
Class objectives	The experimental results should be reported in scientific journals in the field of Dermatology----------
Goals	Inflammatory skin diseases and skin tumors, including the epidemiological approach----------
Class outline	The aim of this Departmental Course is to learn how to collect information for experiments about inflammatory skin diseases and skin tumors, including the epidemiological approach. On the basis of the results obtained, we will discuss the problems and design experimental procedures. Furthermore, we will develop a novel approach for the defense mechanism, aging and carcinogenesis of skin, by using the ultraviolet irradiation model mouse. In addition, pathological, biochemical, and molecular biological techniques will be studied to analyze the changes in the skin condition of some inflammatory diseases and tumors. Finally, the experimental results should be reported in scientific journals in the field of Dermatology.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The report evaluates the following items. 1) The latest knowledge of inflammatory skin diseases and the skin tumors is acquired, and novel results are obtained. 2) A molecular biological technique for analyzing the appearance of disease mechanism of the skin disorder is understood. 3) Method of a pathology and molecular biology experiments concerning the skin defense mechanism has been acquired. 4) An appropriate research topic is set for the skin disease defense mechanism or the carcinogenesis mechanism. 5) Knowledge related to the set research topic is acquired by the student, and an appropriate design of experiment is planned and executed.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(20540)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Agressology()	Hidenobu Kamohara

Goals with their ratio	
Under construction ・・・・100%	
Type of Class	Lecture
Teaching Method	
Course Goals	The target of this lecture is to reveal the point for cerebral resuscitation.
Course Achievement Targets	
Outline	A cardiopulmonary resucitation guideline is revised every 5 years. The importance of the only chestcompression was emphasized on by BLS/ACLS guideline in 2010. The medicine prescription mainly composed of adrenaline and amiodarone was recommended, and choice of medicine treatment was simplified. The cerebral regional oxygenation(rSO2) was evaluated as a possibility of the recovery of brain function. The hypothermia therapy to keep brain function after resuscitation restrains metabolism of the whole body, and it has been clarified that hypothermia therapy would suppress brain cell damage by the oxygen radical in brain ischemia. There is big differential for organ transplantation from brain death among Japan, Europe and America. I will mention the diagnosis of brain death and discuss about a possibility of the future.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The achievement will be evaluated according to the following criteria. 1) Proposal of appropriate research projects on the basis of understanding the agressology. 2) Understanding how to perform clinical researches. 3) Understanding how to prove clinical problems. 4) Understanding for the previous important findings and guideline.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(21350)	1, 2, 3, 4	8	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" II : Agressology()	Hidenobu Kamohara

Goals with their ratio	
Under construction ・・・・100%	
Type of Class	Lecture
Teaching Method	
Course Goals	The goals of this tuition are to understand the characteristics and importance of each organ, and to pursue the future possibilities.
Course Achievement Targets	
Outline	Organ function by a variety of factors such as sepsis established organ dysfunction. The prolonged situation promoted multiple organ failure with their correlation and caused to be death. Mechanical supports such as artificial respirator and dialysis are benefit for organ failure but often have a variety of complications. Medical transplantation is an effective treatment because it replaced the form and function completely, but there is a numerical limit, it remains a problem of long-term use of immunosuppressive agents. Any possible regenerative medicine is expected in the future after idenitification of inducing pluripotent stem (iPS) cells.. Also mesenchymal stem cells (MSC) has the ability to differentiate into mesenchymal cells such as bone and cardiac muscle, and it regulate inflammaton in macrophages. There is a potential to develop anti-inflammatory and regenerative medicine for the organs dysfunction with infection and inflammation..
Textbooks/Materials	None
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their research skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22870)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Anesthesiology()	Yamamoto Tatsuo

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	Supervisor: Tatsuo Yamamoto Program Schedule: year 1-4, every Thursday (4th period) Site and Facilities: seminar room and laboratories at Department of Anesthesiology
Course Goals	
Course Achievement Targets	
Outline	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of pain transmission and cardiovascular resuscitation. The hypothesis must then be proven by clinical or basic experiment. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for pain therapy or for cardiopulmonary resuscitation. Specific research projects to be executed should be determined by searching latest literatures related to the specific fields. Finally, the experimental results should be reported in international scientific journals. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The achievement will be evaluated according to the following criteria. 1) Proposal of appropriate research projects on the basis of understanding the background on the filed of anesthesiology. 2) Understanding how to investigate the mechanisms of pain transmission and cardiovascular resuscitation. 3) Logical/proper experimental design to identify the scientific hypothesis. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute not only to better understanding for anesthesiology but also to successful development of new paradigm for pain treatment and cardiovascular resuscitation.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(23000)	1, 2, 3, 4	8	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" II : Anesthesiology()	Yamamoto Tatsuo

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	Supervisor: Tatsuo Yamamoto Program Schedule: year 1-4, every Thursday (3rd-4th periods) Site and Facilities: seminar room and laboratories at Department of Anesthesiology
Course Goals	
Course Achievement Targets	
Outline	The aim of this class is to acquire the techniques to analyze pain transmission and cardiovascular resuscitation. Specifically, experimental techniques to be earned in this course include establishment of experimental pain models of animals, such as mice and rats, and dog experimental cardiovascular resuscitation model. Particular emphasis is placed also on the attitude of pharmacological and physiological experiment.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills to produce animal models. 2) Understanding how to evaluate the level of pain in the animal model. 3) Understanding how to evaluate the neural state after cardiovascular resuscitation.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20950)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅰ : International Medical Cooperation(“Jissen” Ⅰ)	Haga Yoshio, takahashi takeshi, takemoto shigeki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	演習
Class method	Group lesson
Class objectives	The purpose of this study is to make the students to understand how to plan and implement the clinical research. We will use the examples of infection control, disaster, and quality of care.
Goals	1) The students can state the main points of ethical guidelines. 2) The students can state how to set the research question. 3) The students can understand the research designs and can select them. 4) The students can make the research protocol. 5) The students can state the concept of biostatistics.
Class outline	In a primary lesson, we will instruct prerequisite conditions to conduct clinical research, including 1) ethical guidelines that researchers must obey; 2) how to set up research hypothesis and how to select research design; 3) how to build research protocol; 4) basic knowledge of biostatistics. In a detailed lesson, we will instruct our experience in clinical research concerning infection control and outcome research.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	We will evaluate students in the light of their understandings as follows; 1) Type of ethical guideline that researchers must obey in each study design 2) Type of study design; its advantage and disadvantage 3) How to collect clinical data and how to analyze them 4) Level of evidence

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21760)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ : International Medical Cooperation(Research Conducting Program "Practice" Ⅰ : International Medical Cooperation(“Jissen” Ⅱ))	Haga Yoshio, takahashi takeshi, takemoto shigeki

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	演習
Class method	Group lesson
Class objectives	To understand how to implement critical appraisal and how to write an original article. To start writing the student's own article with the progress of research activity.
Goals	1) To learn the method of critical appraisal based on STROBE statement 2) To understand how to write an original article which editors demond. 3) To start writing of "Methods" and "Introduction" of your own article.
Class outline	We will implement critical appraisal against the literature relating the student's research theme. Then, we will help the students to start writing "Methods" and "Introduction of their own article.
Required Textbooks	
Reading list	
Information concerning enrollment	To read at least 3 original articles relating to the student's own research theme.
Assessment methods and criteria/ratios	We will evaluate students in the light of their understandings as follows; 1) Degree of understanding of STROBE statement 2) Readiness of research background regarding the student's own theme 3) Knowledge of the methodology relating to the student's own research

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22480)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Molecular Cell Biology()	OGURA Teru, YAMANAKA Kunitoshi, ESAKI Masatoshi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Supervisors: Teru Ogura, Kunitoshi Yamanaka, Masatoshi Esaki Program Schedule: year 1-4, every Monday (6th period) Site and Facilities: small conference rooms at IMEG and laboratories at Dept. of Molecular Cell Biology
Class objectives	Students will learn how to propose scientific hypotheses for the regulation of cell homeostasis and growth and how to prove such hypotheses experimentally. Students will be led to perform research projects based on hypotheses, to discuss research results logically, to present in scientific meetings, and to publish research papers in international scientific journals.
Goals	Students will be able to propose scientific hypotheses for the regulation of cell homeostasis and growth, prove such hypotheses experimentally, discuss research results logically, present research findings in scientific meetings, and publish research papers in international scientific journals.
Class outline	The aim of this Departmental Course is to learn how to propose scientific hypotheses for the regulation of cell homeostasis and growth including dynamics and quality control of proteins, biogenesis and maintenance of organelles, cell cycle, and cell division. The hypothesis must be proven experimentally. Experiments should include isolation and characterization of mutants of model organisms such as E. coli, yeast, and worms, analysis of expression and intracellular localization of gene products, identification of interacting proteins, and in vitro biochemical and spectrometric analysis of purified proteins. The experimental results should be presented in scientific meetings, and finally should be published in international scientific journals in the field of molecular cell biology to fulfill requirements for PhD thesis.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their abilities and achievement in the field of regulation of cell growth and homeostasis; ability to propose novel hypotheses and to find out unsolved issues, understanding how to investigate such issues, ability to propose proper research projects, experimental design to achieve the proposed research projects, novel findings, logical discussion, and publication of the research results. The presentation including discussion at the laboratory and meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22600)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Molecular Cell Biology()	OGURA Teru, YAMANAKA Kunitoshi, ESAKI Masatoshi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Supervisors: Teru Ogura, Kunitoshi Yamanaka, Masatoshi Esaki Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Facilities: small conference rooms at IMEG and laboratories at Dept. of Molecular Cell Biology
Class objectives	Students will find out unsolved issues in the field of cell homeostasis and growth, acquire knowledge and techniques to study molecular mechanisms, and acquire ability to design and achieve proper experiments.
Goals	Students will be able to find out unsolved issues in the field of cell homeostasis and growth, to acquire the techniques to analyze molecular mechanisms, and to acquire ability to design and achieve proper experiments.
Class outline	The aim of this class is to acquire the techniques to analyze molecular mechanisms of cell homeostasis and growth and to understand such methodologies. Experimental techniques to be acquired and methodologies to be understood in this course include forward and reverse genetics to isolate mutants, methods of gene cloning, procedures of gene knockout and RNA interference, methods to visualize intracellular localization of gene products, procedures of large scale expression and purification of proteins, and biochemical, biophysical and spectrometric methods to analyze purified proteins in vitro.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their ability to understand recent progress in the field of mechanisms of cell homeostasis and growth, ability to find out unsolved issues, experimental skills and techniques acquired during this course, understanding effectiveness and limitations of various experimental methods, planning and achievement of experiments with proper choice of methods, ability to interpret experimental results, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22490)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Kidney Development()	NISHINAKAMURA Ryuichi, Taguchi Atsuhiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	set up the research plans, perform experiments, and write the paper.
Class objectives	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of organogenesis, especially kidney development. The hypothesis must then be proven experimentally. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for regenerating the organs. Specific research projects to be executed should be determined by searching latest literatures related to organogenesis such as kidney development. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals in the fields of developmental biology, molecular biology, cell biology, and/or kidney diseases. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Goals	read the papers, set up the research plans, perform experiments, present and discuss the data in meetings, and write a PhD thesis
Class outline	1) Proposal of appropriate research projects on the basis of understanding the background on organogenesis, especially kidney development. 2) Understanding how to investigate molecular mechanisms in kidney development. 3) Logical/proper experimental design to identify mechanisms in kidney development. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute not only to better understanding of kidney development but also to successful development of regenerative treatments.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for organogenesis, especially kidney development, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22610)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Kidney Development()	NISHINAKAMURA Ryuichi, TANAKA Satomi, Taguchi Atsuhiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	performed in the laboratory of Kidney Deveopment
Class objectives	The aim of this class is to acquire the techniques to analyze organogenesis, especially kidney development. Specifically, experimental techniques to be earned in this course include establishment of genetically engineered mice, and analysis of gene functions both in vivo and in vitro. Particular emphasis is placed also on proper handling of embryonic stem cells, in situ hybridization, immunostaining, organ culture of the kidney, and overexpression and knockdown of genes of interest in cultured cells, all of which will be thoroughly studied in this Departmental Course.
Goals	acquire various techniques, such as mouse genetics, histology, and cell culture, to analyze organogenesis (especially kidney development and reconstruction)
Class outline	Acquisition of experimental skills to produce and analyze genetically engineered animals. 2) Understanding how to identify abnormalities and genetic interactions in the knockout mice. 3) Acquisition of experimental techniques, including in situ hybridization, section immunostaining, organ culture, overexpression and knockdown in cultured cells, so that the functions of genes of interest can be accurately analyzed and understood. 4) Acquisition of experimental skills to investigate signal transduction mechanisms in the kidney development.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22500)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Brain Morphogenesis(Research on molecular and cellular mechanims of the vertebrate brain development)	SHIMAMURA Kenji, Hatakeyama Jun

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	Design and conduct experiments and studies for given research subjects. Write papers and present obtained results. Conducted at the laboratory and office of Department of Brain Morphogenesis, IMEG.
Class objectives	Conduct researches to understand molecular and/or cellular mechanisms underlying morphogenesis and histogenesis of the vertebrate brain.
Goals	Students are evaluated for their course grades and credits based on their understanding and knowledge obtained about notions of recent progress in the research for developmental biology and neurobiology, and ability for establishing issues to address, planning of experiments, and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	The aim of this course is to understand the classical as well as recent findings and concepts in the field of developmental biology, in order to define research projects and scientific hypothesis for the mechanisms underlying development and evolution of the vertebrate brain. Current specific subjects of interest are regionalization, morphogenesis, and cell lineage of the embryonic brain. Proper experimental plans to address the issues raised by these subjects and to prove the working hypotheses are settled accordingly. Multi-disciplinary approaches (molecular biology, biochemistry, cell biology, anatomy, histology, genetics, bioimaging, and embryology) are employed. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results are presented at domestic as well as international meetings and subjected to international scientific journals in the fields of developmental biology and neurobiology. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	Developmental Biology, Scott F. Glibert
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to some of the following criteria. 1) Proposal of appropriate research projects on the basis of understanding the mechanisms of brain development. 2) Understanding how to investigate developmental biology and neurobiology in general. 3) Ability to design proper experiments and the logics to elucidate the mechanisms underlying brain development. 4) Novel findings obtained by proper analytical approaches. 5) Original and innovative findings that can contribute to the field of developmental biology and neurobiology.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22620)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Brain Morphogenesis(Studies on cellular and molecular mechanisms of the vertebrate brain development and practical trainings of experimental techniques required for the research.)	SHIMAMURA Kenji, Hatakeyama Jiyun

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	Search and reading of literature and references. Instructions and trainings of various experimental procedures. Conducted at laboratory and office of Department of Brain Morphogenesis, IMEG.
Class objectives	Train multidisciplinary experimantal skills necessary for investigating mollecular and cellular mechanisms underlying morphogenesis and histogenesis of the vertebrate brain.
Goals	Students are evaluated for their course grades and credits based on their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’ s presentation and discussion at the laboratory and academic meetings.
Class outline	The aim of this class is to acquire the techniques to investigate mechanisms that regulate development of the vertebrate brain. Experimental techniques to be earned in this course include morphological and histological analyses of the developing neural tissues as well as expression of genes and their products. Experimental embryology such as manipulation of the living embryos, and cell and organ cultures derived from the embryonic brain, and genetic analysis using transgenic animals are expertise of our division. The basic molecular biological methods such as DNA analysis, plasmid construction, are also included. In addition, latest technologies are also encouraged to be studied by actively reading recent literature and attending to appropriate training courses. These skills and techniques will be thoroughly studied and trained in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to some of the following criteria. 1) Acquisition of experimental skills to perform proper genetic as well as surgical manipulations of the living embryos. 2) Understanding how to analyze phenotypes derived from embryological or genetic manipulations. 3) Understanding how to analyze functions of genes involved in regionalization and morphogenesis of the brain. 4) Acquisition of experimental techniques to produce recombinant genes and proteins to reveal their roles in development of brain tissues. 5) Understanding of relevance and significance of the results obtained from experiments for normal development.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22510)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Cell Modulation(To learn how to culture and manipulate the pluripotent stem cells)	Era Takumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実験
Class method	facing lesson
Class objectives	To establish culture, differentiation and analysis techniques of the pluripotent stem cells suach as ES and iPS cells
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for the stem cell, Regenerative medicine and development mechanism, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Class outline	How to culture and manipulate the stem cells such as embryonic stem cells and induced pluripotent stem cells
Required Textbooks	
Reading list	
Information concerning enrollment	To master the knowledge of stem cells
Assessment methods and criteria/ratios	1) Proposal of appropriate research projects on the basis of understanding the background on stem cell biology and developmental mechanisms. 2) Understanding how to investigate molecular basis of the stem cell regulation and differentiation. 3) Logical/proper experimental design to identify the factors that play an essential role in stem cell regulation. 4) Novel findings obtained by appropriate and proper analytical approaches. 5) Original and innovative findings that can contribute to better understanding for stem cell regulation.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22630)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cell Modulation()	Era Takumi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実習
Class method	facing teach
Class objectives	To master how to analyze the KO mouse and the pluripotent stem cells such as ES and iPS cells and evaluate the results
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’ s presentation and discussion at the laboratory and academic meetings.
Class outline	he aim of this class is to acquire the techniques to analyze mouse embryos. Specifically, experimental techniques to be earned in this course include establishment of immunostaining, molecular and biochemical analyses for mouse embryos. Particular emphasis is placed also on establishment of knock-out mice and analytical methods for knock-out mice, and advanced techniques to induce ES/iPS cells into tissue stem cells and to manipulate ES/iPS cells by the methods of molecular biology, all of which will be thoroughly studied in this Departmental Course.
Required Textbooks	
Reading list	
Information concerning enrollment	Master of stem cell biology
Assessment methods and criteria/ratios	1) Acquisition of experimental skills to handle the mouse embryos. 2) Understanding how to do the histological analysis and stain the sections of mouse embryos. 3) Acquisition of experimental techniques to produce recombinant genes, so that their structures and functions can be accurately analyzed and understood. 4) Understanding of theme of the experiments and the plane of the experiments 5) Acquisition of experimental skills to make a hypothesis and to prove a hypothesis using proper experiments.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
Cell Maintenance Departmental Course “Jissen” I	2016whole year	Graduate School of Medical Sciences(22520)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Cell Maintenance(Cell Maintenance Departmental Course “Jissen” I)	TATEISHI Satoshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the regulatory mechanisms of cell cycle, cell division and repair for damaged DNA.
Class objectives	Proposal of appropriate research projects on the basis of understanding the background on the mechanisms of cell cycle checkpoint, DNA repair, cellular senescence, apoptosis (cell death) and cellular senescence.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for cell cycle checkpoint and DNA repair
Class outline	
Required Textbooks	
Reading list	
Information concerning enrollment	Have basic knowledge concerning what is taught in this course
Assessment methods and criteria/ratios	Proposal of appropriate research projects on the basis of understanding the background on the mechanisms of cell cycle checkpoint, DNA repair, cellular senescence, apoptosis (cell death) and cellular senescence. Understanding how to investigate mechanisms of cell cycle checkpoint and tumor suppressor genes.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
Cell Maintenance Departmental Course “Jissen” II	2016whole year	Graduate School of Medical Sciences(22640)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cell Maintenance(Cell Maintenance Departmental Course “Jissen” II)	TATEISHI Satoshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the regulatory mechanisms of apoptosis, recombination and repair for damaged DNA.
Class objectives	Proposal of appropriate research projects on the basis of understanding the background on the mechanisms of apoptosis, recombination and repair for damaged DNA.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for apoptosis, recombination and repair for damaged DNA.
Class outline	
Required Textbooks	The Cell
Reading list	The Cell
Information concerning enrollment	Have basic knowledge concerning what is taught in this course
Assessment methods and criteria/ratios	Proposal of appropriate research projects on the basis of understanding the background on the mechanisms of cell cycle checkpoint, DNA repair, cellular senescence, apoptosis (cell death) and cellular senescence. Understanding how to investigate mechanisms of cell cycle checkpoint and tumor suppressor genes.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22530)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Cell Differentiation(Cell Differentiation “Jissen” I)	OGAWA Minetaro

Goals with their ratio
Under construction ・・・・100%

Type of Class	Other
Teaching Method	All instructions in the processes that are necessary to fulfill requirements for PhD thesis are conducted in this departmental course.
Course Goals	The aim of this departmental course is to learn how to conduct research on the developmental processes of the hematopoietic and vascular systems.
Course Achievement Targets	1) Methodologies for identification and functional examination of stem cells are well understood. 2) Genetical and cell biological approaches to investigate the hematopoietic and vascular development are learned. 3) Methodologies for regulation of in vitro differentiation of embryonic stem cells are well understood. 4) A research project is properly set up to elucidate the mechanisms of hematopoietic and vascular development. 5) Logical and proper experimental design is set up and performed to solve the problems. 6) Novel findings on the development of hematopoietic and vascular systems are obtained. 7) Research findings are properly presented and discussed in an academic environment.
Outline	The latest literatures are first examined to understand current status of the research fields. On the basis of the knowledge obtained by searching the literatures, specific research projects are set up to elucidate the molecular and cellular mechanisms underlying (1) establishment of the multiple potentials and self-renewal capability of hematopoietic stem cells and (2) development of the higher order architecture of the vascular system. The study tool includes FACS purification of specific cell populations, in vitro differentiation of embryonic stem cells, genetically-engineered mice, as well as general molecular and cell biological approaches. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results are reported in international scientific journals in the fields of hematology, vascular biology, cell biology, and/or developmental biology.
Textbooks/Materials	
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on their understanding and knowledge earned about scientific information on recent progress in the research for the mechanisms of hematopoietic and vascular development, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22650)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Cell Differentiation(Cell Differentiation “Jissen” II)	OGAWA Minetaro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	The basic experimental techniques are thoroughly studied and put into practice on a specific research project.
Class objectives	The aim of this class is to acquire the techniques to investigate the mechanisms of developmental processes of the hematopoietic and vascular systems.
Goals	1) Methods for purification of stem cells by using flow cytometry are mastered. 2) Methods for functional identification of hematopoietic stem cells are mastered. 3) Cellular and molecular biological approaches to analyze hematopoiesis and vascular development are learned. 4) Methods for in vitro differentiation of embryonic stem cells are mastered. 5) A research project is properly set up to elucidate the mechanisms of hematopoietic and vascular development. 6) Logical and proper experimental design is set up and performed to solve the problems.
Class outline	Experimental techniques to be learned in this course include flow cytometry and cell sorting, in vitro colony formation assay of hematopoietic progenitor cells, long-term bone marrow cell culture, bone marrow cell transplantation, in vitro differentiation of hematopoietic and vascular cells from embryonic stem cells, and other cellular and molecular methodologies to analyze hematopoiesis and vascular development. These techniques are put into practice on a specific research project aimed at elucidation of the mechanisms of hematopoietic and vascular development.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22550)	1, 2, 3, 4	10	others
Course Title(Theme)			Instructor(s)		
Research Conducting Program "Practice" I : Stem Cell Biology()			Niwa Hitoshi		
Goals with their ratio					
Under construction ・・・・100%					
Type of Class	Other				
Teaching Method	Seminar, practice and skill training will be held at Department of Pluripotent Stem Cell Biology in IMEG.				
Course Goals	Understanding the cell biological characters of mouse embryonic stem cells and the molecular mechanisms determining them.				
Course Achievement Targets	establishment of the ability to perform the basic research as an autonomous researcher				
Outline	Seminar, practice and skill training will be held for (1) analysis of molecular mechanism governing self-renewal or (2) analysis of molecular mechanism governing differentiation.				
Textbooks/Materials					
Reading List					
Enrollment Prerequisites					
Assessment Methods and Criteria	Oral presentation, discussion and research report				

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22670)	1, 2, 3, 4	8	others
Course Title(Theme)			Instructor(s)		
Research Conducting Program "Practice" II : Stem Cell Biology()			Niwa Hitoshi		
Goals with their ratio					
Under construction ・・・・100%					
Type of Class	Other				
Teaching Method	Seminar, practice and skill training will be held at Department of Pluripotent Stem Cell Biology in IMEG.				
Course Goals	Understanding the cell biological characters of mouse embryonic stem cells and the molecular mechanisms determining them.				
Course Achievement Targets	establishment of the ability to perform the basic research as an autonomous researcher				
Outline	Seminar, practice and skill training will be held for (1) analysis of molecular mechanism governing self-renewal or (2) analysis of molecular mechanism governing differentiation.				
Textbooks/Materials					
Reading List					
Enrollment Prerequisites					
Assessment Methods and Criteria	Oral presentation, discussion and research report				

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22560)	1, 2, 3, 4	10	others

Course Title(Theme)	Instructor(s)
Research Conducting Program "Practice" I : Medical Cell Biology(Medical Cell Biology, “Jissen” I)	NAKAO Mitsuyoshi, Saitou Noriko, Hino Shinjirou

Goals with their ratio
Under construction ・・・・100%

Type of Class	Other
Teaching Method	seminar room and laboratories at Department of Medical Cell Biology
Course Goals	The goals of this Course is to understand the molecular basis of epigenetic regulation in development and human diseases.
Course Achievement Targets	As the achievement targets, students can understand and explain the molecular basis of epigenetic regulation and the significance in development and human diseases.
Outline	The term epigenetics is defined as “heritable changes in gene expression that occur without a change in DNA sequence”. This is involved in determining cell identity in development, regeneration, aging and cancer. Students will perform medical science-oriented research by studying how cells establish, maintain or erase their identities by formation of transcriptionally active or inactive chromatins at specific genes. On the basis of the hypothesis and the results obtained, further experimental design will be constructed to discover a novel evidence for epigenetic regulation. Specific research projects need to be done using information from database and latest literatures. Research projects and working hypothesis can be improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals as well as conferences.
Textbooks/Materials	EPIGENETICS (David Allis et al., Cold Spring Harbor Laboratory Press, 2007)
Reading List	
Enrollment Prerequisites	
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their understanding about epigenetics, and ability to do experiments and criticism of the results obtained. The presentation at the laboratory and academic meetings is also taken into consideration. 1) Understanding significance of epigenetics in life science. 2) Understanding relationship between epigenetics and human diseases. 3) Proper experimental design to identify the mechanism of epigenetic regulation. 4) Novel findings obtained by appropriate and proper analytical approaches.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22680)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Medical Cell Biology(Medical Cell Biology, “Jissen” II)	NAKAO Mitsuyoshi, Saitou Noriko, Hino Shinjirou

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	seminar room and laboratories at Department of Medical Cell Biology
Class objectives	The goals of this Course is to learn the techniques to analyze the epigenetic regulation in development and human diseases.
Goals	As the achievement targets, students can master the techniques to analyze the epigenetic cell/gene regulation in development and human diseases.
Class outline	This class covers the techniques to analyze the epigenetic cell/gene regulation. Especially, experimental techniques to be earned in this course include various assays in cell biology, molecular biology, biochemistry and genetics, using cultured cells and experimental animals such as mice. Particular emphasis is placed on functional analysis of genes and proteins that are involved in epigenetic regulation important for development, regeneration, metabolism, aging and cancer. Advanced techniques of DNA/RNA sequencing and bioinformatics, and translational medical researches based on epigenetic studies for diagnosis, prevention and treatment of human diseases are also covered.
Required Textbooks	EPIGENETICS (David Allis et al., Cold Spring Harbor Laboratory Press, 2007)
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills acquired, and reports submitted for evaluation. The report can be substituted by presentation and discussion at the laboratory and academic meetings. 1) Acquisition of experimental skills in epigenetics. 2) Understanding the role of epigenetic mechanisms in physiology and human diseases. 3) Ability to design appropriate experiments and to investigate epigenetic regulation. 4) Acquisition of experimental skills to investigate gene and chromatin in cells and animals.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22270)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research I()	TAKIGUCHI Masafumi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	
Class objectives	This course is structured to expose students to the latest and important discoveries in immunology and virology. Students will learn how to formulate a hypothesis on the underlying biological mechanisms and to prepare written/oral reports on research findings.
Goals	Students will learn: 1) antigen processing and recognition and their original findings on the subjects. 2) viral antigens recognized by the immune system and immune responses against the antigens and their original findings on the subjects. 3) basic research and clinical applications for the regulation of immune responses and their original findings. 4) previous literature relevant to their research 5) to form reasonable hypotheses and implement their experimental plans.
Class outline	The course will emphasize on how to test a hypothesis experimentally by studying cells and molecules involved in antiviral immunity and immune regulations. The focus will be on, but not limited to, identifying genes coding for antigens and functional molecules that play a role in antiviral immune responses and to studying the gene expression, the structures of the gene products, and their tissue localization. Based on the their empirical findings, students will design experimental systems, using molecular, cellular, and developmental biology techniques, to understand the molecular functions of newly identified genes in the antiviral immune system and viral pathogenesis. They will further explore the possibility of application to immunotherapy. Students are expected to prepare written and oral reports.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grades will be based upon attendance, understanding literatures relevant to students' research and the ability to evaluate them, students' overall performance and the quality of project design, implementation, oral presentations, and written reports. Manuscripts prepared for publication and presentations at the lab meetings or domestic/ international conferences may be substituted for written assignments.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22370)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research I()	TAKIGUCHI Masafumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実験
Class method	
Class objectives	The course will emphasize on experimental methods, including various cellular immunology, biochemical, and molecular techniques necessary for immune analysis of human and mice.
Goals	Students will learn: 1) to isolate immune cells and analyze their morphology and functions. 2) to investigate the structures and functions of proteins involved in the immune responses. 3) to examine gene structure and function of genes expressed in the immune system. 4) viral infection and experimental techniques for infection. 5) to form reasonable hypotheses and implement their experimental plans.
Class outline	The course will cover how to isolate and identify immune cells and to examine immune responses by antigen presenting cells and T lymphocytes both in vivo and in vitro. The focus will also be on molecular and biochemical methods to analyze immune molecules and antigens and introduce students to techniques for cellular infection.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grades will be based upon attendance, students' experimental techniques and skills learned during the course, and laboratory reports. Manuscripts prepared for publication and presentations at the lab meetings or domestic/ international conferences may be substituted for written assignments.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22280)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research II()	MATSUSHITA Shuzo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実験
Class method	All instructions which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Class objectives	Students are supposed to propose a research hypothesis and to set a necessary experimental procedure for research on the pathogenesis and intervention of HIV-1 infection. Latest reports concerning the relationship between anti-HIV immune response such as neutralizing antibody and cytotoxic T-cell and the evolution of the virus will be reviewed. Making use of these, participants are supposed to analyze the role of anti-HIV immune response in the viral pathogenesis and the mechanism of escape from immunity. The research strategy should be tested by making use of experimental system using cell biology, molecular biology and immuno-chemical techniques. In addition, researches concerning the application to new treatment strategy such as immune-therapy and the development of vaccine that induces the neutralizing antibody also serve as a goal.Students have to complete original and innovative works necessary to fulfill requirements for PhD thesis.
Goals	Students are evaluated for their course grades and credits based on the course hours completed. Their understanding and knowledge earned about scientific information on recent progress in the research for pathogenesis and host defense mechanism of HIV-1 infection, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research. Students have to complete original and innovative works necessary to fulfill requirements for PhD thesis.
Class outline	Learning from literatures which use samples from HIV-1 infected individuals or in vitro models students are supposed to propose a research hypothesis and to set a necessary experimental procedure for research on the pathogenesis and intervention of HIV-1 infection.The research strategy should be tested by making use of experimental system using cell biology, molecular biology and immuno-chemical techniques. In addition, researches concerning the application to new treatment strategy such as immune-therapy,research toward cure and the development of vaccine that induces the neutralizing antibody also serve as a goal. On the basis of the results obtained, further experimental design will be constructed to develop a novel approach for prevention and treatment of HIV-1 infection. Finally, the experimental results should be reported in international scientific journals in the fields of microbiology, biochemistry, molecular biology, and/or infectious diseases.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding the pathogenesis and up-dated treatment strategy against HIV-1 infection. 2) Understanding the role of anti-HIV immune response in the viral pathogenesis. 3) Proposal of appropriate research projects for the prevention and treatment of HIV-1 infection. 4) Logical/proper experimental design to accomplish the proposed research project. 5) Original and innovative findings that can contribute not only to better understanding pathogenesis but also to development of prevention and treatment of HIV-1 infection.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22380)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research II()	MATSUSHITA Shuzo

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実習及び実技
Class method	All instructions of this course are conducted in seminar room and laboratories at “AIDS Research II
Class objectives	The aim of this class is to acquire the techniques to analyze samples from HIV-1 infected individuals (clinical cases or animal models) or in vitro model origin to understand the pathophysiology of HIV-1 infection.
Goals	Students are supposed to complete the course hours and learn their experimental skills and techniques during the class.
Class outline	The aim of this class is to acquire the techniques to analyze samples from HIV-1 infected individuals (clinical cases or animal models) or in vitro model origin to understand the pathophysiology of HIV-1 infection. For example, individual viral sequence is determined by automated sequencer after amplification of specific gene from the samples by PCR. The sequence data are subjected to the phylogenic analysis. In addition, experiments using pseudoviruses and cell sorter analyses are performed with regard to the cell mediated immunity and the humoral immunity including neutralizing antibody. With these techniques research program will be conducted to contribute not only to better understanding pathogenesis but also to successful development of prevention and treatment of HIV-1 infection. Finally, students will be trained for documentation and oral presentation of the experimental results obtained.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Acquisition of experimental skills with respect to genetic and biological aspects and obtaining new findings. 2) Appropriate study is proposed in regard to the pathogenesis, prevention and treatment of the HIV-1 infection 3) Whether the experimental design is appropriate to the subject of study proposed and executed properly. 4) Original findings that can contribute to understanding the pathogenesis of HIV-1 infection and successful development of prevention and treatment of HIV-1 infection are obtained.

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22290)	1, 2, 3, 4	10	others
Course Title(Theme)			Instructor(s)		
Research Conducting Program "Practice" I : AIDS Research III()			OKADA Seiji		
Goals with their ratio					
Under construction ・・・・100%					
Type of Class	Practice and Training				
Teaching Method	Practice and discussion.				
Course Goals	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of the interaction between hematopoietic-immune system and viral infection. The hypothesis must then be proven experimentally.				
Course Achievement Targets	Propose the research work related Labo project. Perform the experiments, make discussion according to the data and literature review. Complete at least one project, present the paper at the conference, and write the English paper.				
Outline	Practice how to conduct the original research. Learn how to find and read the research paper, how to present at the meeting and conference, and how to write the original research paper.				
Textbooks/Materials					
Reading List					
Enrollment Prerequisites					
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for microbial pathogenesis and host defense mechanism, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.				

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22390)	1, 2, 3, 4	8	others
Course Title(Theme)			Instructor(s)		
Research Conducting Program "Practice" II : AIDS Research III()			OKADA Seiji		
Goals with their ratio					
Under construction ・・・・100%					
Type of Class	Practice and Training				
Teaching Method	Practice and discussion.				
Course Goals	The aim of this Departmental Course is to learn how to propose scientific hypothesis for the mechanisms of the interaction between hematopoietic-immune system and viral infection. The hypothesis must then be proven experimentally.				
Course Achievement Targets	Propose the research work related Labo project. Perform the experiments, make discussion according to the data and literature review. Complete at least one project, present the paper at the conference, and write the English paper.				
Outline	Practice how to conduct the original research. Learn how to find and read the research paper, how to present at the meeting and conference, and how to write the original research paper.				
Textbooks/Materials					
Reading List					
Enrollment Prerequisites					
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for microbial pathogenesis and host defense mechanism, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.				

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22300)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research IV()	SUZU Shinya

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Practice on HIV-1 research
Class objectives	To educate students so that they can make experimental plans, perform those experiments, appropriately interpret the results, write the manuscript
Goals	students can reach the levels with which they make experimental plans, perform those experiments, appropriately interpret the results, write the manuscript
Class outline	By focusing myeloid cells, students learn how they make experimental plans, perform those experiments, appropriately interpret the results, write the manuscript
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Whether students are enough to make experimental plans, perform those experiments, appropriately interpret the results, write the manuscript

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22400)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research IV()	SUZU Shinya

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Shinya Suzu will teach experimental techniques necessary for HIV-1 research that focus on myeloid cells
Class objectives	To learn experimental techniques necessary for HIV-1 research that focus on myeloid cells such as macrphages
Goals	Students can reach the levels with which they can perform research to understand the HIV-1 pathogenesis
Class outline	By focusing myeloid cells such as macrophages and fibrocytes, students will learn experimental techniques necessary to understand HIV-1 pathogenesis
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Whether students are enough to perform research to understand the HIV-1 pathogenesis

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22310)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research V()	UENO Takamasa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	The program will emphasize on how to raise their own scientific questions, to propose hypotheses, and to design experimental strategies to answer the questions by analyzing cells, proteins, and genes involved in antiviral immunity and viral pathogenesis.
Class objectives	Based on their own findings, students are expected to write scientific manuscripts to be submitted to internationally recognized journals in the fields and give oral and poster presentations in academic conferences.
Goals	Grades will be based on attendance and overall performance in understanding and critically reviewing scientific literature, and quality of experimental design, findings, and presentations. Manuscripts for scientific papers and presentations at domestic/international conferences will be counted towards the overall course grade.
Class outline	The course is structured to expose students to the recent and important discoveries in HIV/AIDS biology as well as human antiviral immune responses and discuss how to perform research studies. The program will emphasize on how to raise their own scientific questions, to propose hypotheses, and to design experimental strategies to answer the questions by analyzing cells, proteins, and genes involved in antiviral immunity and viral pathogenesis. The focus will be on, but not limited to, functional aspects of human T cells, molecular basis of antigen recognition, as well as HIV accessory proteins. Based on their own findings, students are expected to write scientific manuscripts to be submitted to internationally recognized journals in the fields and give oral and poster presentations in academic conferences. All academic and scientific activities listed above are PhD course requirements and will be conducted under the supervision of the instructor.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their understandings of background and their research agendas in their own research interests. 2) their understandings of the role of anti-HIV immune responses and viral pathogenesis. 3) their ability to formulate scientific questions and hypotheses. their ability to implement strategic experimental design, accomplish research projects, and draw logical conclusions by evaluating their own experimental results.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22410)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research V()	UENO Takamasa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	The course is structured for students to learn experimental methods to address their scientific questions and test hypotheses.
Class objectives	The program will emphasize on experimental techniques for viral replication, viral pathogenesis, human immune responses, flow-cytometric analysis of cellular functions, biochemical analysis of recombinant proteins, as well as gene technologies. The course will also cover how to work safely with biohazardous materials such as HIV.
Goals	Grades will be based on attendance and overall performance in experimental techniques and skills learned during the course. Manuscripts for scientific papers and presentations at domestic/international conferences and intra-laboratory meetings will be counted towards the overall course grade.
Class outline	The course is structured for students to learn experimental methods to address their scientific questions and test hypotheses. The program will emphasize on experimental techniques for viral replication, viral pathogenesis, human immune responses, flow-cytometric analysis of cellular functions, biochemical analysis of recombinant proteins, as well as gene technologies. The course will also cover how to work safely with biohazardous materials such as HIV.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated on to the following criteria: 1) their skills and knowledge to work safely with biologically hazardous materials. 2) their skills and knowledge of viral replication and pathogenesis. 3) their skills and knowledge to isolate and maintain cells involved in antiviral immune responses. 4) their skills and knowledge to analyze functional aspects of cells, proteins, and genes. 5) their skills and knowledge to prepare and analyze recombinant proteins and their functions.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22330)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research VII(Virology of HIV-1)	Ariumi Yasuo

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	Instructor: Yasuo Ariumi Opening: 1~4 full year Period: every Tuesday 6th period Venue: AIDS VII Laboratory
Class objectives	After getting the knowledge about HIV-1 virology, research theme and/or project was planned and practiced.
Goals	Final goal is to plan the research theme and project by yourself after getting the basic knowledge about HIV-1 virology.
Class outline	Learning of HIV-1 virology about HIV-1 structure, life cycle and related host factors, and AIDS pathogenesis. Planning of research theme and/or research project and the practice. Presentation of research progress report and research achievement in the domestic or international meeting.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation will be performed as follows: 1) Understanding of research field and background as well as research project. 2) Getting knowledge of HIV-1 virology and how to study HIV-1. 3) Planning the research project and the practice. 4) Research achievement: getting new results and knowledge regarding your research project.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22430)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research VII()	Ariumi Yasuo

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	Instructor: Yasuo Ariumi Opening: 1 - 4, full year Period: every Thursday 6 - 7 periods Venue: AIDS VII Laboratory
Class objectives	Getting research skills how to analyze HIV-1 to clarify the HIV-1 life cycle by virological, cellular biological, or molecular biological method.
Goals	Getting research skills how to analyze HIV-1 to clarify the HIV-1 life cycle by virological, cellular biological, or molecular biological method.
Class outline	Learning research skills how to analyze HIV-1 to clarify the HIV-1 life cycle by virological, cellular biological, or molecular biological method, including cell culture, HIV-1 infection study in the BSL3 facility, observation of cellular localization under confocal laser scanning microscopy, DNA sequencing, gene cloning, PCR, and biochemical methods.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Evaluation was performed by checking following experimental skills: 1) Getting research skills how to analyze HIV-1 by cellular biological, biochemical, or molecular biological method. 2) Cell culture skill of human cells. 3) Method of production and analysis of recombinant proteins. 4) Getting knowledge and skills how to do virus infection study safely.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22350)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research IX()	Shinichi Oka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義・演習
Class method	Supervisor: Shinichi Oka Program Schedule: year 1-4, every Tuseday (5th-6th period) Site and Facilities: seminar room at ACC of National Center for Global Health and Medicine
Class objectives	The aim of thie program is to learn how to make protocols for clinical studies to resolve current clinical problems
Goals	
Class outline	The aim of thie program is to learn how to make protocols for clinical studies to resolve current clinical problems. Baesd on their findings, students are expected to write scientific manuscripts to be submitted to internationally recognized journals and give oral or poster presentations in academic conferences.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their understandings of research agenda in their own interests. 2) their understandings of clinical data and analyzing technique. 3) their ability to formulate scientific questions and hypotheses. 4) their accomplishment of research projects.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22450)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research IX()	Shinichi Oka

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Shinichi Oka Program Schedule: year 1-4, every Wednesday (5th periods) Site and Facilities: laboratories at ACC of National Center for Global Health and Medicine
Class objectives	The aim of this program is to learn how to diagnose, treat, and prevent complications related to AIDS
Goals	Students will learn how to make protocols for clinical studies to resolve these clinical problems.
Class outline	The aim of this program is to learn how to diagnose, treat, and prevent complications related to AIDS. Students will learn how to make protocols for clinical studies to resolve these clinical problems.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their knowledge of clinical complications related to AIDS 2) their knowledge of how to diagnose, treat, and prevent complications related to AIDS 3) their accomplishment of research projects

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22360)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research X()	Hiroyuki Gatanaga

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Hiroyuki Gatanaga Program Schedule: year 1-4, every Wednesday (6th period) Site and Facilities: seminar room at ACC of National Center for Global Health and Medicine
Class objectives	Students will learn how to analyze HIV mutations and changes of viral loads in infected patients and discuss their clinical significance.
Goals	Baesd on their findings, students are expected to write scientific manuscripts to be submitted to internationally recognized journals and give oral or poster presentations in academic conferences.
Class outline	Students will learn how to analyze HIV mutations and changes of viral loads in infected patients and discuss their clinical significance. The program will emphasize on how to raise their own scientific questions, to propose hypotheses, and to design experimental strategies to answer the questions by analyzing clinical samples. Baesd on their findings, students are expected to write scientific manuscripts to be submitted to internationally recognized journals and give oral or poster presentations in academic conferences.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their understandings of clinical backgrounds and their research agenda in their own interests. 2) their understandings of HIV clinical pathogenesis and analyzing technique. 3) their ability to formulate scientific questions and hypotheses. 4) their accomplishment of research projects.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22460)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research X()	Hiroyuki Gatanaga

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Supervisor: Hiroyuki Gatanaga Program Schedule: year 1-4, every Thursday (6th & 7th periods) Site and Facilities: laboratories at ACC of National Center for Global Health and Medicine
Class objectives	The aim of this program is to learn the optimization of antiretroviral therapy to each infected and tailor-made medicine in HIV treatment
Goals	Students will learn and analyze both of viral fators and host (patient) factors which influence the effects of antiretroviral therapy.
Class outline	The aim of this program is to learn the optimization of antiretroviral therapy to each infected and tailor-made medicine in HIV treatment. Students will learn and analyze both of viral fators and host (patient) factors which influence the effects of antiretroviral therapy.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their skills and knowledge of the viral factors which influence the effects of antiretroviral therapy. 2) their skills and knowledge of the host factors which influence the effects of antiretroviral therapy. 3) their accomplishment of research projects

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22740)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅰ ： AIDS Research XI()	Tetsuro Matano

Goals with their ratio
Under　construction ・・・・100%

Teaching Style	講義・演習
Class method	Supervisor: Tetsuro Matano Program Schedule: year 1-4, every Tuesday (6th period) Site and Facilities: Seminar rooms and laboratories at National Institute of Infectious Diseases
Class objectives	The course is structured to expose students to the latest findings on virus-host immune interaction in HIV infection and the current progress in AIDS vaccine development.
Goals	Based on their findings, students are expected to write scientific manuscripts to be submitted to internationally-recognized journals and give oral or poster presentations in academic conferences.
Class outline	The course is structured to expose students to the latest findings on virus-host immune interaction in HIV infection and the current progress in AIDS vaccine development. Students will have a chance to perform virological and immunological analyses in primate AIDS models. The program will emphasize on how to design and perform scientific experiments to elucidate the requisites for HIV control, contributing to development of an effective AIDS vaccine. Based on their findings, students are expected to write scientific manuscripts to be submitted to internationally-recognized journals and give oral or poster presentations in academic conferences.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their understandings of virus-host immune interaction in HIV infection. 2) their understandings of the current progress in AIDS vaccine development. 3) their ability to formulate scientific questions and hypotheses. 4) their accomplishment of research projects.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22760)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ ： AIDS Research XI()	Tetsuro Matano

Goals with their ratio
Under　construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Tetsuro Matano Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Facilities: Seminar rooms and laboratories at National Institute of Infectious Diseases
Class objectives	The aim of this program is to learn how to perform virological and immunological analyses in HIV and simian immunodeficiency virus (SIV) infection.
Goals	Students will learn how to make protocols for basic studies toward AIDS vaccine development.
Class outline	The aim of this program is to learn how to perform virological and immunological analyses in HIV and simian immunodeficiency virus (SIV) infection. Students will learn how to analyze viral genome diversity and host cellular/humoral immune responses, and will have a chance to join vaccine trials in primate AIDS models. Students will learn how to make protocols for basic studies toward AIDS vaccine development.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students will be evaluated by the following criteria: 1) their knowledge on viral genome diversity in HIV/SIV infection. 2) their knowledge on host cellular/humoral immune responses in HIV/SIV infection. 3) their skills to perform virological and immunological analyses in primate AIDS models. 4) their knowledge on AIDS vaccine trials. 5) their accomplishment of research projects.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22770)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research XII()	Yoshimura Kazuhisa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Supervisor: Kazuhisa Yoshimura Program Schedule: year 1-4, every Thursday (6th period) Site and Facilities: seminar room and laboratories at “AIDS Research Center, NIID”
Class objectives	The aim of this course is to learn how working hypotheses have been proposed and confirmed regarding recent important progresses in HIV/AIDS including the action mechanism of anti-HIV-1 drugs and/or neutralizing antibodies, and the mechanism of resistance for drugs and/or antibodies, by showing several examples.
Goals	Students are expected to search latest literatures about (i) functional molecules of host and virus components involved in viral replication, (ii) anti-HIV drugs, (iii) neutralizing antibodies, and (iv) the mechanism of resistance for drugs and/or antibodies. On the basis of findings obtained, experimental design will be constructed to develop novel anti-HIV therapies and anti-HIV drugs for clinical applications using molecular and pharmacological approach.
Class outline	The aim of this course is to learn how working hypotheses have been proposed and confirmed regarding recent important progresses in HIV/AIDS including the action mechanism of anti-HIV-1 drugs and/or neutralizing antibodies, and the mechanism of resistance for drugs and/or antibodies, by showing several examples. Students are expected to search latest literatures about (i) functional molecules of host and virus components involved in viral replication, (ii) anti-HIV drugs, (iii) neutralizing antibodies, and (iv) the mechanism of resistance for drugs and/or antibodies. On the basis of findings obtained, experimental design will be constructed to develop novel anti-HIV therapies and anti-HIV drugs for clinical applications using molecular and pharmacological approach. Finally, the experimental results should be orally presented in academic meetings and reported in international scientific journals. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated for each research project according to the following criteria. 1) Acquisition of latest findings and advances in life cycle of HIV-1. 2) Acquisition of latest findings and advances in anti-HIV drugs, neutralizing antibodies, and mechanisms of resistance. 3) Acquisition of experimental skills to culture HIVs and cells. 4) Acquisition of experimental skills to produce recombinant HIVs. 5) Proposal of appropriate experimental design and execution for conducting research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22900)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research XII()	Yoshimura Kazuhisa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Kazuhisa Yoshimura Program Schedule: year 1-4, every Tuesday (6th-7th periods) Site and Facilities: seminar room and laboratories at “AIDS Research Center, NIID”
Class objectives	The aim of this course is to acquire virological, biochemical, and molecular-biological techniques
Goals	
Class outline	The aim of this course is to acquire virological, biochemical, and molecular-biological techniques analyzing microbiological study of HIV-1 infection which cause AIDS and related diseases. Specifically, experimental techniques to be learned in this course include WST-8 assay, TZM-bl-assay, and p24Ag ELISA for the titration of HIV, and PCR cloning, sequence analysis, and phylogenic analysis for classification of HIV-1 genomes. In addition, experiments using pseudo-typed viruses and cell sorter analyses are performed. All techniques in the above-mentioned assays are conducted in this course.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated for each research project according to the following criteria. 1) Acquisition of experimental skills to use clinical isolates. 2) Acquisition of experimental skills with respect to genetic and biological aspects. 3) Acquisition of experimental skills to analyze the action mechanism of anti-HIV drugs and neutralizing antibodies. 4) Acquisition of experimental skills to analyze the replication kinetics of HIV with mutations. Appropriate experimental design and execution of conducting research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22780)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : AIDS Research XIII()	Sato Yorifumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and discussion
Class objectives	The goal is to establish their own skill to design, plan, perform, and evaluate the research by themselves.
Goals	Understanding about recent major finding about virology, molecular cell biology, immunology, and genomic biology. In addition, overall performance and understanding of their own scientific research project.
Class outline	Recent major finding about virology, molecular cell biology, immunology, and genomic biology. In addition, experimental findings regarding retroviral latency.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Understanding about recent major finding about virology, molecular cell biology, immunology, and genomic biology. 2) Knowledge and understanding for the fundamental and latest notion about retroviral life cycle, persistent infection, and pathogenesis. 3) Experimental findings regarding retroviral latency. 4) Overall performance and understanding of scientific research project.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22910)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : AIDS Research XIII()	Sato Yorifumi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	Lecture and discussion
Class objectives	The goal is to establish their own skill to design, plan, perform, and evaluate the research by themselves.
Goals	Understanding about recent major finding about virology, molecular cell biology, immunology, and genomic biology. In addition, overall performance and understanding of their own scientific research project.
Class outline	Recent major finding about virology, molecular cell biology, immunology, and genomic biology. In addition, experimental findings regarding retroviral latency.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) Understanding about recent major finding about virology, molecular cell biology, immunology, and genomic biology. 2) Knowledge and understanding for the fundamental and latest notion about retroviral life cycle, persistent infection, and pathogenesis. 3) Experimental findings regarding retroviral latency. 4) Overall performance and understanding of scientific research project.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20370)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
"Research Conducting Program ""Practice"" I :Reproductive Engineering(Reproductive biology)	NAKAGATA Naomi

Goals with their ratio	
Under　construction ・・・・100%	
Teaching Style	その他
Class method	Lecturer : Naomi Nakagata Place : Center for Animal Resources & Development (CARD) Plactice laboratory 1 and 2 (503 and 504)
Class objectives	To learn concerning the reproductive engineering technologies and the basic reproductive engineering techniques.
Goals	To learn techniques for In Vitro Fertilization, Cryopreservation of Embryos and Sperm and Embryo Transfer.
Class outline	The aim of this Departmental Course is to learn the basic reproductive engineering techniques (In Vitro Fertilization, cryopreservation of embryos and sperm and embryo transfer).
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for the reproductive biology and the basic reproductive engineering techniques. The presentation including discussions at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the doctor’s degree research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21180)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Reproductive Engineering()	NAKAGATA Naomi

Goals with their ratio	
Under　construction ・・・・100%	
Teaching Style	その他
Class method	Lecturer : Naomi Nakagata Place : Center for Animal Resources & Development (CARD) Plactice laboratory 1 and 2 (503 and 504)
Class objectives	To master concerning the reproductive engineering technologies and the basic reproductive engineering techniques.
Goals	To master techniques for In Vitro Fertilization, Cryopreservation of Embryos and Sperm and Embryo Transfer.
Class outline	The aim of this Departmental Course is to master the basic reproductive engineering techniques (In Vitro Fertilization, Cryopreservation of Embryos and Sperm and Embryo Transfer).
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about scientific information on recent progress in the research for the reproductive biology and the basic reproductive engineering techniques. The presentation including discussions at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the doctor’s degree research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22710)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Bioinformatics(Bioinformatics)	ARAKI Masatake

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Supervisor: Masatake Araki Program Schedule: year 1-4, every Tuesday (6th period) Site and Facilities: seminar room and laboratories at Division of Bioinformatics, IRDA
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge learned about scientific information on recent progress in the research for gene technology and molecular biology, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.
Goals	The achievement will be evaluated according to the following criteria. 1) Acquisition of an understanding of English papers for research project in the fields of gene technology and molecular biology. 2) Understanding how to generate transgenic mice and knockout mice. 3) Understanding of basic technology of experimental genetics. 4) Appropriate research project and experimental design to analyze disease model mice. 5) Novel findings obtained by the analysis of disease model mouse phenotypes.
Class outline	The aim of this Departmental Course is to understand the important role of various disease model mice in the fields of medical and pharmaceutical science, and to learn essential skill of gene technology and molecular biology. For this purpose, several examples of disease model mice should be presented in seminar. Some of gene trap mouse lines to be analyzed should be determined by screening for specific research projects. Then precise analysis of trapped gene and mouse phenotypes should be done. Research projects and working hypothesis can be modified and improved depending on the progress and achievement of research. Finally, the experimental results should be reported in international scientific journals. All instructions in the above-mentioned processes, which are necessary to fulfill requirements for PhD thesis, are conducted in this Departmental Course.
Required Textbooks	Distribute required materials suitably.
Reading list	"Mouse Phenotypes" V. E. Papaioannou & R. R. Behringer
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge learned about scientific information on recent progress in the research for gene technology and molecular biology, and ability for experimental planning and interpretation and criticism of the results obtained. The presentation including discussion at the laboratory and academic meetings is also taken into consideration to assess the level of achievement in the PhD research.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22720)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Bioinformatics(Bioinformatics)	ARAKI Masatake

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	Supervisor: Masatake Araki Program Schedule: year 1-4, every Thursday (6th-7th periods) Site and Facilities: seminar room and laboratories at Division of Bioinformatics, IRDA
Class objectives	The achievement will be evaluated according to the following criteria. 1) Understanding how to use mouse resource database. 2) Acquisition of how to annotate trapped genes. 3) Acquisition of how to analyze of genotype and phenotype of disease model mice. 4) Acquisition of how to use ES cells and early stage embryo of mouse. 5) Appropriate research project and experimental design to analyze disease model mice.
Goals	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’ s presentation and discussion at the laboratory and academic meetings.
Class outline	The aim of this class is to understand the importance of disease model mouse by explain the principle and meaning of gene trap method. Experimental techniques in the fields of experimental genetics, biochemistry and molecular biology should be learned in this course in order to analyze trapped gene and mouse phenotype. Specifically, (i) annotation of trapped gene by 5’ -RACE, inverse PCR and plasmid rescue, (ii) analysis of genotype and phenotype of gene trap mice by southern blot, northern blot, immunoassay and so on, (iii) how to use Embryonic Stem (ES) cells and early stage embryo of mouse, all of which will be studied in this Departmental Course.
Required Textbooks	Distribute required materials suitably.
Reading list	"Mouse Phenotypes" V. E. Papaioannou & R. R. Behringer
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding how to use mouse resource database. 2) Acquisition of how to annotate trapped genes. 3) Acquisition of how to analyze of genotype and phenotype of disease model mice. 4) Acquisition of how to use ES cells and early stage embryo of mouse. 5) Appropriate research project and experimental design to analyze disease model mice.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(20470)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : Radioisotope Science()	KOJIMA Akihiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実験
Class method	Investigation of related references, planning and execution of experiments for specific theme, and writing paper. All instructions for the research are conducted in this Departmental Course.
Class objectives	The aim of this course is to learn the basic and applied theories for nuclear medicine imaging technology through experiment and computer simulations, and develop quantitative imaging techniques that allow to perform more accurate diagnosis and effective radiation therapy.
Goals	To understand the principle and theory about nuclear medicine imaging technology with real radioactive phantom experiments and computer simulation and to perform practical study to solve the problems hat hamper the accurate quantification of radioactivity in the human body.
Class outline	This course is aimed at learning the latest quantitative methods on recent nuclear medicine imaging techniques and the usefulness of innovative imaging instruments and image-processing software developed as imaging modalities for a basic experiment and/or clinical application based on those methods. Furthermore, various problems that hamper the accurate quantification of radioactivity in the body using SPECT and PET will be explored and the development of a new method to solve these problems will be required. The performance of this method developed will be examined in some computer simulated models and experimental phantom studies. If the usefulness and effectiveness of this method is confirmed through the calculation or experiment, further research will be required for the application of clinical imaging.
Required Textbooks	
Reading list	
Information concerning enrollment	Radiation worker registration in Kumamoto University
Assessment methods and criteria/ratios	

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21280)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Radioisotope Science()	KOJIMA Akihiro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実験
Class method	Investigation of related references, planning and execution of experiments for specific theme, and writing paper. All instructions for the research are conducted in this Departmental Course.
Class objectives	The aim of this course is to understand the necessity and usefulness of SPECT, x-ray CT, and light (fluorescence and luminescence) imaging modalities for human and small animals in in vivo molecular imaging and to develop imaging techniques to greatly assist studies on drug development, pathological condition analysis, therapeutic effect, etc.
Goals	To learn molecular imaging techniques with SPECT, x-ray CT, and real-time in vivo light imaging systems and to optimize the method combined with these modalities.
Class outline	The aim of this course is to develop more effective molecular imaging techniques with radioisotopes to make pharmacodynamics analysis of drugs, quantification of physiological functions, and finding of lesions feasible for humans and small animals (mice and rats). For the study of the clinical radioisotope imaging, 3-D anthropomorphic phantom models and computer simulations will be employed in SPECT to investigate the improvement of quantitative accuracy on the measurement of physiological functions. In molecular imaging for small animals, three modalities, SPECT, x-ray CT, and light imaging, are combined each other to improve lesion detectability in vivo.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25010)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : IRCMS-I(IRCMS-I)	Takizawa Hitoshi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	in the seminar room and the laboratory at International Research Center for Medical Sciences
Class objectives	The course is intended to expose students to the latest and important findings in the field of immunology and hematology, and discuss the background of the discoveries, how the hypothesis was formulated and proved by experiments.
Goals	Finally, the research progresses in the above-mentioned processes are necessary to fulfill requirements for PhD thesis, and reported by oral presentation.
Class outline	The course is intended to expose students to the latest and important findings in the field of immunology and hematology, and discuss the background of the discoveries, how the hypothesis was formulated, and how the questions were addressed experimentally. The students will have research projects on the response of human or mouse hematopoietic stem cells to hematopoietic stress such as infection, autoimmunity, ageing, and learn experimental approaches/techniques of molecular, cellular, and developmental biology, that are required to address the questions raised in their project. In parallel, they will learn the state-of-the art technologies and apply them to develop novel analysis for the project upon need. Students are expected to learn how to present their own results, and to publish it in a scientific journal.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) their knowledge on conventional and the latest findings on immunology and hematology upon studying literatures. 2) their progress to learn conventional and novel experimental techniques positively. 3) their ability to formulate hypothesis and design/plan appropriate experiments for their research project. 4) their progress on their research project.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25020)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : IRCMS-I(IRCMS-I)	Takizawa Hitoshi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	in the seminar room and the laboratory at International Research Center for Medical Sciences
Class objectives	The course is intended to learn various experimental approaches/techniques with hematopoietic stem cell (HSC) biology, cell biology, and molecular biology, that are required to analyze hematopoietic cells including human and mouse HSCs.
Goals	The course is intended to learn various experimental approaches/techniques with hematopoietic stem cell (HSC) biology, cell biology, and molecular biology, that are required to analyze hematopoietic cells including human and mouse HSCs.
Class outline	The course is intended to learn various experimental approaches/techniques with hematopoietic stem cell (HSC) biology, cell biology, and molecular biology, that are required to analyze hematopoietic cells including human and mouse HSCs. For instance, isolation of immune and hematopoietic cells using fluorescence activated cell sorting/analyzer, in vitro or in vivo functional analysis of HSCs, protein/gene analysis using molecular biology and genetic engineering, single cell analysis, animal experimentation such as HSC transplantation.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) their knowledge on immunophenotype and function of HSCs, and progress on learning basic experimental techniques that are required for their HSC biology 2) their experimental skills on analysis of protein/gene involved in HSC maintenance. 3) their knowledge on lymphoid and hematopoietic tissues, and relevant experimental skills. 4) their experimental skills on general and HSC oriented mouse experimentation. 5) their ability to design/plan appropriate experiments for their research project and the progress.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25030)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅰ : IRCMS-Ⅱ(IRCMS-Ⅱ)	Sashida Goro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	その他
Class method	generally in the seminar room and laboratories at “IRCMS-Ⅱ”
Class objectives	The course is structured to expose students to the latest and important findings on hematopoiesis and hematological malignancies and discuss how to have a hypothesis on the underlying mechanisms.
Goals	Finally, the research progresses in the above-mentioned processes are necessary to fulfill requirements for PhD thesis, and reported by oral presentation.
Class outline	The course is structured to expose students to the latest and important findings on hematopoiesis and hematological malignancies and discuss how to have a hypothesis on the underlying mechanisms. The program will emphasize on how to examine a hypothesis experimentally by studying hematopoietic stem cells involved in hematopoiesis and/or leukemia. We will focus to study genes that play a role in hematopoietic stem cells and/or leukemic stem cells and also examine the regulation of genes/oncogenes, the structures of the gene products, and their biological function in vivo. Based on the their empirical findings, students will design experimental systems, using biological, molecular, and biochemical techniques to understand the molecular mechanisms of identified genes in hematopoietic stem cells and leukemic cells. Students are expected to prepare written and oral reports. This course does not contain any studies for retrovirus-induced malignancies (e.g. HTLV-induced T cell leukemia).
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) their knowledge of hematopoiesis and hematopoietic malignancies. 2) their skills to isolate hematopoietic stem cells and analyze the functions. 3) their skills to isolate hematopoietic malignant cells/leukemic cells and analyze the functions of tumor formation. 4) their knowledge of previous literatures relevant to their research and their ability to form rational hypotheses.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25040)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" Ⅱ : IRCMS-Ⅱ(IRCMSー Ⅱ)	Sashida Goro

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	generally in the seminar room and laboratories at “IRCMS-Ⅱ”
Class objectives	The course will emphasize on experimental methods including cellular and molecular techniques analyzing hematopoietic cells in mice.
Goals	The course will emphasize on experimental methods including cellular and molecular techniques analyzing hematopoietic cells in mice.
Class outline	The course will emphasize on experimental methods including cellular and molecular techniques analyzing hematopoietic cells in mice. Students will learn how to analyze and isolate hematopoietic stem cells and leukemic cells to examine their biological function in mice. This course also covers molecular and biochemical methods to determine the function of oncogenes for hematopoietic malignancies. This course does not contain any studies for retrovirus-induced malignancies (e.g. HTLV-induced T cell leukemia).
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) their knowledge of hematopoiesis and hematopoietic malignancies. 2) their skills to isolate hematopoietic stem cells and analyze the functions. 3) their skills to isolate hematopoietic malignant cells/leukemic cells and analyze the functions of tumor formation. 4) their ability to form reasonable hypotheses and perform their rational experimental plans.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25050)	1, 2, 3, 4	10	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" I : IRCMS-III()	SHENG GEORGE GUOJUN

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	In the seminar room and the laboratory at International Research Center for Medical Sciences.
Class objectives	The course is designed to introduce the concept of EMT and its involvement in developmental and cancer biology. Students will gain an appreciation of dynamic nature of multi-cellular organization and morphogenesis in animal development and an understanding of the link between normal and abnormal EMTs.
Goals	Students will learn the basics of cell shape changes and their regulation in development and disease. Students will understand the diversity of developmental EMTs and their link to cancer EMTs. Students will be trained to look at human diseases from developmental and cell biology perspectives.
Class outline	The course is designed for students to gain basic and advanced understanding of epithelial-mesenchymal transition (EMT). EMT is a morphogenetic process important in both animal development and human diseases. Students will learn key concepts of cell shape changes during development and cancer progression. Students will also learn molecular and imaging techniques necessary for studying cellular morphogenesis in vivo. Ability to understand the link between developmental and cancer EMTs will be stressed. Students will carry out research projects using developmental EMT models to study specific cancer EMTs.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) knowledge on cell shape changes during animal development and in human cancer upon reading relevant literature; 2) progress in learning experimental techniques necessary for the analysis of cellular morphogenesis; 3) ability to formulate hypothesis and think critically; 4) progress in their research project on epithelial-mesenchymal transition.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(25060)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : IRCMS-III()	SHENG GEORGE GUOJUN

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	その他
Class method	In the seminar room and the laboratory at International Research Center for Medical Sciences.
Class objectives	The course is intended to teach students key concepts of early vertebrate development. Through literature reading and research projects, students will gain an understanding of developmental principles of stem cell biology and translational medicine.
Goals	Students will carry out critical reading of relevant literature on early animal development. They will formulate hypotheses concerning germ layer formation and mesoderm differentiation, and experimentally test these hypotheses using in vitro and in vivo models.
Class outline	The course is designed for students to gain basic and advanced understanding of amniote early development, germ layer formation and mesoderm differentiation through critical literature reading and hands-on project-based research. Classical and modern experimental approaches/techniques will be taught, including embryo culture, embryo manipulation and live imaging, molecular and functional studies of lineage differentiation, and genome-level comparative analysis and microscopy. Students are expected to actively take part in research projects, data analysis and oral and written presentation.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	1) knowledge on classical and latest findings on mesoderm formation and patterning upon reading relevant literature; 2) progress in learning experimental techniques necessary for studying mesoderm development; 3) ability to formulate hypothesis and think critically; 4) progress in their research project on mesoderm formation and patterning.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21860)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Metabolomics()	Yuichi Oike, Hiroyuki Nakanishi, Kazuya Yamagata, Motohiro Takeya, Yukio Ando, Shokei Mitsuyama

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習及び実技
Class method	Program Schedule: year 2-4, every Tuesday (6th-7th periods) Site and Facilities: seminar room and laboratories at each Department
Class objectives	The aim of this Jissen II is to acquire the techniques to analyze the molecular mechanisms of metabolic regulation of cells, via small-molecule metabolite profiling, i.e., metabolomics. This modern post-genome technology can greatly help us to obtain a better understanding of the molecular basis various diseases, e.g., metabolic syndromes, cancer, etc., which in turn can promote successful development of diagnostic and therapeutic endeavor for many diseases.
Goals	1) Understanding of the theoretical background and principle of methods for metabolomics analyses. 2) Understanding how to apply the MS analysis to the metabolomics, and acquiring the operation techniques with mass spectrometers. 3) Acquisition of techniques to prepare experimental models to observe generate metabolic and signaling responses of cells in culture and in tissues in vivo, in which chemical identification of a diverse array of low-molecular-weight metabolites and signaling molecules can be performed via the metabolomics analysis. 4) Capability for accurate experimental planning and evaluation of the results obtained from the metabolomics to better understand molecular mechanisms of physiology of cell regulation and pathogenesis of various diseases.
Class outline	The aim of this Jissen II is to acquire the techniques to analyze the molecular mechanisms of metabolic regulation of cells, via small-molecule metabolite profiling, i.e., metabolomics. This modern post-genome technology can greatly help us to obtain a better understanding of the molecular basis various diseases, e.g., metabolic syndromes, cancer, etc., which in turn can promote successful development of diagnostic and therapeutic endeavor for many diseases. In particular, such subjects to be earned in this course include a basic principle of bioinformatics established as proteomics/metabolomics (LC-MS/MS etc.), practical operation of analytical instruments (e.g., MS), and their advanced techniques for application to the analysis of various signaling and metabolic molecules derived from cultured and in vivo cells and tissues and even from clinical specimens.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21870)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" II : Metabolic information epidemiology()	Katoh Takahiko, Ikeda Manabu, Gi Chiyounen, Usuku Koichiro

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	Meeting
Class objectives	Students are evaluated for their course grades and credits based on the course hours completed, their experimental skills and techniques acquired during this course, and reports submitted for evaluation. The report assessment can be substituted by the assessment of each student’s presentation and discussion at the laboratory and academic meetings.
Goals	The achievement will be evaluated according to the following criteria. 1) Understanding of the theoretical background and principle of methods for metabolomics analyses. 2) Understanding how to apply the MS analysis to the metabolomics, and acquiring the operation techniques with mass spectrometers. 3) Acquisition of techniques to prepare experimental models to observe generate metabolic and signaling responses of cells in culture and in tissues in vivo, in which chemical identification of a diverse array of low-molecular-weight metabolites and signaling molecules can be performed via the metabolomics analysis. 4) Capability for accurate experimental planning and evaluation of the results obtained from the metabolomics to better understand molecular mechanisms of physiology of cell regulation and pathogenesis of various diseases.
Class outline	The aim of this Jissen II is to acquire the techniques to analyze the molecular mechanisms of metabolic regulation of cells, via small-molecule metabolite profiling, i.e., metabolomics. This modern post-genome technology can greatly help us to obtain a better understanding of the molecular basis various diseases, e.g., metabolic syndromes, cancer, etc., which in turn can promote successful development of diagnostic and therapeutic endeavor for many diseases. In particular, such subjects to be earned in this course include a basic principle of bioinformatics established as proteomics/metabolomics (LC-MS/MS etc.), practical operation of analytical instruments (e.g., MS), and their advanced techniques for application to the analysis of various signaling and metabolic molecules derived from cultured and in vivo cells and tissues and even from clinical specimens.
Required Textbooks	International papers
Reading list	Epidemiology -an introduction (KJ Rothman), Designing clinical research (SB Hulley et al.)
Information concerning enrollment	
Assessment methods and criteria/ratios	

11. Departmental Course “Practice(jissen)” III

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21880)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" III : Diagnostic Image Analysis("Practice" III : Diagnostic Image Analysis)	YAMASHITA Yasuyuki, KITAJIMA Mika

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	Conference
Class objectives	Understanding on imaging studies
Goals	Understanding on imaging studies
Class outline	Update of knowledge of CT, MR and PET, Presentation of imaging studies. Following conferences will be given; Program Schedule: year 1-4, every Tuesday 7:00 (A total of 15 studies); Neuroradiology Conference; Head&Neck-Radiology Conference; Oral and Maxillofacial Surgery-Radiology Conference; Gastroenterological Surgery-Pathology-Radiology Conference; Thoracic Surgery-Pathology- Radiology Conference; Obstetrics and Gynecology-Radiology Conference Site and Facilities: Diagnostic Radiology Conference Room 6F; Each Conference Room
Required Textbooks	
Reading list	
Information concerning enrollment	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge for diagnostic imaging, ability for clinical study interpretation, and their reports submitted. The presentation including discussion at the conference meetings is also taken into consideration.
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Understanding and knowledge of the ideal method of diagnostic imaging according to specific diseases and organs. 2) Understanding and knowledge of radiologic anatomy of various organs. 3) Proposal and execution of appropriate research projects in imaging studies.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21890)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" III : Surgical therapeutics for Cancer(Research Conducting Program "Practice" III : Surgical therapeutics for Cancer)	BABA Hideo, Suzuki Makoto, In Hironobu, INOMATA Yukihiro, YUMOTO Eiji, MIZUTA Hiroshi, KATABUCHI Hidetaka, NAKAYAMA Hideki, IWASE Hirotaka, Yoshiaki Kawano, Hideo Nakamura

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Site and Facilities: seminar room and laboratories at each department, award and consultation room of University hospital, chemotherapies center. We receive practical training in 240 hours in total during three or four annual. We choose a field in hope of training and receive practical training in X 30 days (240 hours in total) for eight hours. We can choose the field of plural number. About the details of the training, obey the instructions of the field charge teacher of each field.
Class objectives	To experience some clinical cases and to acquire the acknowledge and skills of latest surgical treatments in each department for various types of cancer as follows: digestive cancer, lung cancer, head and neck tumor, oral cancer, breast cancer, bone soft part tumor, gynecologic tumor, genitourinary system tumor, skin cancer and pediatric cancer.
Goals	The aims of the current lecture are to understand thoroughly the leading-edge medical treatment for various types of cancer as follows: (1) gastroenterological tumor (2) respiratory tract tumor (3) brain and nervous system neoplasm (4) head and neck tumor (5) otolarygological neoplasia (6) breast endocrine tumor (7) genitourinary system tumor (8) gynecological tumor (9) orthopaedic and neuro-musculoskeletal tumor (10) skin tumor (11) hematopoietic tumor (12) pediatric tumors.
Class outline	In the current program, we will provide the opportunity to experience some clinical cases and to acquire the acknowledge and skills of latest surgical treatments in each department for various types of cancer as follows: digestive cancer, lung cancer, head and neck tumor, oral cancer, breast cancer, bone soft part tumor, gynecologic tumor, genitourinary system tumor, skin cancer and pediatric cancer. You can learn not only the techniques of surgical resection of primary tumor and lymph node dissection but also the acknowledge of peri-operative chemoradiotherapy. Furthermore, you can experience the medical clinical training in each department to learn the peri-operative management, pre- or post operative adjuvant therapy for cancer. You can also be in charge of patients depending on department.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	【Evaluation for Grades and Credits】 Student evaluations are based on attendance, understanding / knowledge regarding cancer treatments, clinical study planning performance / result interpretation, and presentation skills and active participation in discussions. 【Evaluation Criteria】 1) Integrated knowledge of surgical treatment for various cancer 2) Integrated knowledge of adaptation of the surgical cure, an operative method and complication

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21900)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" III : Radiation Oncology()	OYA Natsuo

Goals with their ratio
Under construction ‥‥100%

Teaching Style	講義
Class method	Supervisor: Natsuo Oya Program Schedule: year 1-4, every Tuesday (5th period) Site and Facilities: Radiotherapy Planning Room , New Clinical Laboratory and Examination Center BF
Class objectives	The aim of this Departmental Course is to acquire the knowledge and techniques to treat cancer patients with radiotherapy, and to plan and perform a clinical research in radiation oncology. Students will learn radiation biology, radiation physics and clinical radiation oncology to understand the role of radiation therapy in multidisciplinary cancer treatment.
Goals	The aim of this Departmental Course is to acquire the knowledge and techniques to treat cancer patients with radiotherapy, and to plan and perform a clinical research in radiation oncology. Students will learn radiation biology, radiation physics and clinical radiation oncology to understand the role of radiation therapy in multidisciplinary cancer treatment.
Class outline	Recently, the clinical significance of radiotherapy has been widely recognized as an important strategy in multidisciplinary cancer treatment, as a minimally invasive and highly curative treatment, and one of the promising strategies in cancer palliation. Also, according to the recent progress in information technology, high-precision 3-D conformal external beam radiotherapy has been developed and entered clinical practice. By patients undergoing radiotherapy, the procedure of eligibility decision, the technique of radiotherapy field setting and dose fractionation planning, the technique of irradiation, will be discussed. In addition, the principle and method of high-precision 3-D conformal external beam radiotherapy, including stereotactic radiotherapy, intensity modulated radiotherapy and functional image-incorporating radiotherapy, will be also studied. The study results should be reported in international scientific journals in the fields of radiation oncology.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	The achievement will be evaluated according to the following criteria. 1) Integrated knowledge of radiation biology and its clinical application. 2) Integrated knowledge of radiation physics and its clinical application. 3) Integrated knowledge of clinical radiation oncology and ability to make an appropriate eligibility decision and treatment planning. 4) Understanding and knowledge of the principle and method of high-precision 3-D conformal external beam radiotherapy. 5) Proposal and execution of appropriate research projects in clinical radiation oncology.

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21910)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" III : Cancer Chemotherapy(Research Conducting Program "Practice" III)	IWASE Hirotaka, Yamamoto Tatsuo, SASAKI Yutaka, BABA Hideo, TASHIRO Masafumi, Betsupu Tooru, SUGITA Michiko, TANAKA Motohiko, NAGAHAMA Hiroyasu, ICHINOSE Keisuke, YAMAMOTO Yutaka, Chikamoto Akira, Miyamoto Yuuji

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	講義
Class method	face-to-face class lesson, group learning, flipped class lesson, e-learning
Class objectives	
Goals	The aims of the current lecture are to understand thoroughly the leading-edge medical treatment for various types of cancer as follows: (1) gastroenterological tumor, (2) breast and thyroid cancer, (3) hematological malignancies, (4) supporteive therapy, pain control and paliative care.
Class outline	This course helps students to understand the practice of chemotherapy for the malignant tumor in each organs, e.g. mechanism of action, adaptation, method, adverse events. Also this course helps to get the title of specialist of medical oncologist.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(21930)	1, 2, 3, 4	8	other

Course name(Theme)	Instructor
Research Conducting Program "Practice" III : Clinical metabolic informatics(Lecture Series “Jissen” III: Clinical metabolic informatics)	ARAKI Eiichi, HOKIMOTO Seiji, MUKOUYAMA Masashi, TANIHARA Hidenobu, FUKUI Toshihiro, NAKAJIMA Makoto, KATABUCHI Hidetaka, OHBA Takashi

Goals with their ratio	
Under construction ・・・・100%	
Teaching Style	実習
Class method	Clinical practice will be done for 240 hours during grade 3 and grade 4.The field which you hoped is selected, and 8 hours × 30 days are practiced to the standard (During 240 hours in total). It is also possible to select two or more fields. According to instruction of the allotment teacher in each field of details of practice
Class objectives	This course aims understanding the latest knowledge and the technology in the diagnosis and the treatment of the various metabolic diseases.
Goals	Explain the importance of the diagnosis and treatment of the metabolic disorders and the lifestyle-related diseases is now increasing. Explain the latest knowledge and the technology of the diagnosis and the treatment of each disease are acquired by taking charge of the cases of diabetes mellitus, dyslipidemia, angina pectoris, cardiac infarction, chronic kidney disease, diabetic nephropathy, diabetic retinopathy, cerebral infarction, cerebral hemorrhage, sterility, and the polycystic ovary syndrome, etc. on a clinical site.
Class outline	The importance of the diagnosis and treatment of the metabolic disorders and the lifestyle-related diseases is now increasing. In this class, the latest knowledge and the technology of the diagnosis and the treatment of each disease are acquired by taking charge of the cases of diabetes mellitus, dyslipidemia, angina pectoris, cardiac infarction, chronic kidney disease, diabetic nephropathy, diabetic retinopathy, cerebral infarction, cerebral hemorrhage, sterility, and the polycystic ovary syndrome, etc. on a clinical site.
Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report.

12. Developmental Biology and Regenerative Medicine

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22140)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Special Lecture on Developmental Biolog(Special Lecture "Tokuron" on Developmental Biology and Regenerative Medicine I)	OGAWA Minetaro, SHIMAMURA Kenji, NAKANISHI Hiroyuki, Era Takumi, OGURA Teru, YAMANAKA Kunitoshi, Oota Kunimasa, NAKAO Mitsuyoshi, NISHINAKAMURA Ryuichi, OKANO Masaki

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Reports are considered for those who are regularly absent for unavoidable reasons.
Class objectives	Developmental and regenerative medicine aims at curing diseases by revealing molecular mechanisms of organ development. In this course, you learn basic concepts and techniques used in this filed. This course serves as introductory for those in the Course of Developmental Biology and Regenerative Medicine, and will also be useful for those in other programs, as you obtain essential knowledge of cell differentiation and growth, cell adhesion and cell-cell interactions essential for the organogenesis, pluripotent stem cells and tissue stem cells, developmental mechanism of organogenesis derived from ectoderm, endoderm and mesoderm and the molecular basis of epigenetic cell regulation in development and human diseases.
Goals	In this course, students are expected to acquire competence to understand and explain following subjects; (1) cell differentiation and growth, (2) cell adhesion and cell-cell interactions essential for the organogenesis, (3) pluripotent stem cells and tissue stem cells, (4) developmental mechanism of organogenesis derived from ectoderm, endoderm and mesoderm, (5) molecular basis of epigenetic cell regulation in development and human diseases.
Class outline	Following topics including the most recent progresses will be shown and discuss in addition to reading original papers. ・ Stem cell and regenerative medicine ・ Development of hematopoetic stem cells ・ Development and regeneration of the nervous system ・ Cell lineage and developmental regulation of the nematode C. elegans ・ C. elegans as a model for human diseases ・ Membrane dynamics ・ Neurogenesis and neural circuit formation ・ Kidney development and regeneration ・ Epigenetic cell regulation in cell differentiation and transformation

Each Summary

No.	Date	Theme	Summary
1	10/13	Thu. 4th period. Takumi Era 【eE-0】	Pluripotent and tissue stem cells
2	10/20	Thu. 4th period. Takumi Era 【eE-0】	Stem cell, disease and clinical application
3	10/27	Thu. 4th period. Minetaro Ogawa	Development of the hematopoetic system
4	11/10	Thu. 4th period. Minetaro Ogawa	Development of hematopoetic stem cells
5	11/17	Thu. 4th period. Kenji Shimamura	ES cells as a tool for developmental and regenerative neurobiology
6	11/24	Thu. 4th period. Kunitoshi Yamanaka	Cell lineage and developmental regulation of the nematode C. elegans
7	12/01	no schedule	Annual Meeting of the MBSJ
8	12/08	Thu. 4th period. Teru Ogura	C. elegans as a model for human diseases
9	12/15	Thu. 4th period. Hiroyuki Nakanishi 【eE-0】	Membrane dynamics____
10	12/22	Thu. 4th period. Kunimasa Ohta	Neural stem cells, neurogenesis, and their clinical application
11	01/12	Thu. 4th period. Kunimasa Ohta	Neuronal circuit formation and regenerative medicine
12	01/19	Thu. 4th period. Ryuichi Nishinakamura	Development of kidney__
13	01/26	Thu. 4th period. Masaki Okano	Regulatory mechanism of epigenetics in development
14	02/02	Thu. 4th period. Mitsuyoshi Nakao 【eE-0】	Epigenetic medicine I__
15	02/09	Thu. 4th period. Mitsuyoshi Nakao 【eE-0】	Epigenetic medicine II

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	“Essential Developmental Biology” (3rd edition by Slack JMW.) Blackwell Publishing (2012) “C. ELEGANS II” (ed. D.L. Riddle, T. Blumenthal, B.J. Meyer, & J.R. Priess) CSHL Press (1997) “EPIGENETICS” (edited by David Allis et al.) Cold Spring Harbor Laboratory Press (2007)
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on the student's understanding of the course subject matter as well as participation in class discussions. The students' understanding will be evaluated on the basis of reports or exams to be scored from 0 to 100 for each session. Final grades will be based on the average of the top 10 scores.
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22150)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Special Lecture on Developmental Biolo()	★Niwa Hitoshi, Itou Takaaki, In Hironobu, INOMATA Yukihiro, Sakamoto Seisuke, YUMOTO Eiji, ENDO Fumio, Andou Yukio, Minoda Riyousei, NAKAMURA Kimitoshi, SAKAGUCHI Hisashi, Jiyouno Hirofumi, Niimori Kanako

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in discussion is encouraged.
Class objectives	Developmental and regenerative medicine aims at curing diseases by revealing molecular mechanisms of organ development and the origin of diseases in order to develop a diagnosis and treatment for the diseases. Furthermore, this course will up-to-date with the present status of the regeneration medicines, the on going investigations on replacement of lost cells, tissues or organs. In this course, you will obtain essential knowledge on embryonic stem cells, tissue stem cells, their properties and application on regenerative medicine, mechanisms of development and repairs of epithelial tissues, methodologies in the regenerative medicine of sensory and circulatory organ, tissue injury and restoration surgery, genetic defects and their treatments, status and problems in transplant medicine.
Goals	During attending the lectures in this course, students are expected to be familiar with general basics of developmental biology and specific developmental biology and mechanisms of diseases in various organs including the liver, lung, heart, nervous tissue, inner ear and connective tissues.
Class outline	In this course, lectures on the following fields will be given: ・Regenerative medicine using embryonic stem cells and tissue stem cells ・properties and application of endodermal tissue stem cells ・growth, differentiation and abnormalities of epithelial cells ・damage, repair and mechanisms of tissue reconstitution ・pathological analyses of hereditary amyloidosis ・development of treatment for hereditary amyloidosis ・development and regeneration of skin（recovery of injury） ・denervation and reinnervation of the larynx ・regeneration of cochlear hair cells ・basic and clinic on vascular neogenesis ・treatment of ischemic heart disease ・pathological analysis and treatment of genetic diseases ・tissue and organ grafts in general, present status and problems of liver transplant

Each Summary

No.	Date	Theme	Summary
1	02/20	【1st grade】 4th period Hitoshi NIWA 【eE-0】	Self-renewal of pluripotent stem cells
2	02/27	4th period Hitoshi NIWA 【eE-0】	Differentiation of pluripotent stem cells
3	03/06	4th period Takaaki ITO	Growth, differentiation and morphological abnormalities of epithelial cells
4	03/13	4th period Kanako NIIMORI (Takaaki ITO)	Mechanism of neural differentiation and its involvement in cancer differentiation and proliferation
5	03/27	4th period Kimitoshi NAKAMURA	Regenerative medicine for diseases of childhood
6	02/20	【2nd grade】 4th period Yukio ANDO	Pathological analyses of hereditary amyloidosis
7	02/27	4th period Hirofumi JONO	Development of treatment for hereditary amyloidosis
8	03/06	4th period Hironobu IHN 【eE-0】	Development and regeneration of skin（recovery of injury）
9	03/13	4th period Ryosei MINODA 【eE-0】	Neuropathy and treatment of larynx paralyses
10	03/27	4th period Ryosei MINODA 【eE-0】	Regeneration of cochlear hair cells
11	02/16	【3rd grade】 4th period Hisashi SAKAGUCHI 【eE-0】	Basic and clinic on vascular neogenesis
12	02/23	4th period Hisashi SAKAGUCHI 【eE-0】	Treatment of ischemic heart disease
13	03/02	4th period Kimitoshi NAKAMURA	Pathological analysis and treatment of genetic diseases
14	03/09	4th period Yukio INOMATA 【eE-0】	Present status and problems of organ transplants
15	03/16	4th period Yukihiro INOMATA 【eE-0】	Liver grafts from brain-dead and living donor

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation, paper summaries, and the final report. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of papers and quizzes related to the topics dealt with in class to be scored from 0 to 100. Final grades will be based on the average score of the papers and quizzes as well as participation in class discussions.
Language of instruction	lecture in Japanese + Japanese textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22160)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Special Lecture on Transplantation immunolog()	NISHIMURA Yasuharu, INOMATA Yukihiro, OSHIUMI Hiroyuki, SENJU Satoru, AWAI Hirotake, IRIE Atsushi

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義
Class method	PowerPoint and/or OHP will be used in the lectures, and active participation in the discussion is encouraged. Extra classes or video lectures are considered for those who are regularly absent for unavoidable reasons.
Class objectives	The goals of this lecture are to understand the followings: (1) The mechanism of rejection in allo-transplantation (2) Allo-antigens that induce allo-reactivity (3) The structure and function of human major histocompatibility complex (HLA) (4) Basic immunology and clinical immuno-regulation therapy to avoid graft-rejection (5) Current status and future direction of transplantation medicine
Goals	Understanding of the mechanisms of rejection in allo-transplantation, the structures of major histocompatibility complexes and the basics in clinical immuno-regulation therapy and transplantation medicine
Class outline	To treat the patients, transplantation of the cells, tissues, or organs obtained from donors is broadly carried out. However, there are structural differences of proteins, lipids, and sugars between different individuals of the same species, due to genetic polymorphism. Therefore, following the transplantation of a graft obtained from an allogeneic donor, the recipient immune system is activated by such polymorphic molecules and reject the graft. Among such allogeneic antigens, MHC are the strongest in stimulating allo-reactive immune response. We will lecture on the basic and clinical immunology related to the methodology to avoid such rejection. In addition, we will provide the latest information on the issue of clinical transplantation and regenerative medicine. We will lecture on the transplantation immunology at the level of cells, tissues, and organs, from the viewpoint of both basic and clinical medicine, including recent advances in the research by the instructors.

Each Summary

No.	Date	Theme	Summary
1	10/17	Mon 4th period, Yasuharu Nishimura 【eJ-0, eE-0, eEJ-0】	Structure and function of HLA class I
2	10/24	Mon 4th period, Yasuharu Nishimura 【eE-0, eEJ-0】	Structure and function of HLA class II
3	10/31	Mon 4th period, Atsushi Irie	Polymorphism of MHC and T cell- activation signals
4	11/07	Mon 4th period, Satoru Senju 【eEJ-L】	Recognition of alloantigens by T cells
5	11/14	Mon 4th period, Yasuharu Nishimura 【eJ-0, eE-0, eEJ-0】	HLA and anti-tumor immunity
6	11/21	Mon 4th period, Atsushi Irie	Major and minor histocompatibility antigens
7	11/28	Mon 4th period, Satoru Senju 【eE-0】	Immune response and dendritic cells
8	12/05	Mon 4th period, Satoru Senju 【eE-0】	Pluripotent stem cells and immune therapy
9	12/12	Mon 4th period, Hiroyuki Oshiumi, Hirotake Awai	Graft versus Host reaction（GVHR）
10	12/19	Mon 4th period, Hiroyuki Oshiumi, Hirotake Awai	Immune-suppression
11	12/26	Mon 4th period, Hiroyuki Oshiumi, Hirotake Awai	Transplantation immunology and NF-κB
12	01/16	Mon 4th period, Hiroyuki Oshiumi, Hirotake Awai	Transplantation immunology and Stem cell
13	01/23	Mon 4th period, Hiroyuki Oshiumi, Hirotake Awai	Steroid receptors and immune-suppression
14	01/30	Mon 4th period, Yukihiro Inomata【eE-0, eEJ-0】	Transplantation in Japan and the world
15	02/06	Mon 4th period, Yukihiro Inomata【eE-0, eEJ-0】	Liver transplant from living donor

Required Textbooks	Textbooks are not specified, and handouts will be distributed.
Reading list	・"The Immune System" by Peter Parham. Garland Publishing Inc. New York and London, 2004 ・"Janeway’s Immunobiology Seventh Edition" by Kenneth Murphy, Paul Travers, Mark Walport. Garland Science, Taylor & Francis Group LLC. New York and Abingdon, 2008. ・” A history of transplantation immunology” (Leslie Brent) Academic Press 1997
Information concerning enrollment	It is recommended for you to read a syllabus and indicated recommended readings in advance.
Assessment methods and criteria/ratios	Achievement of the Objectives will be evaluated by active class participation and the reports of which the theme will be specified after the lectures. Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of the reports and brief examinations related to the topics dealt with in the class to be scored from 0 to 100. Final grades will be based on the average of the best 10 scores of the reports and brief examinations as well as the participation in class discussions.
Language of instruction	lecture in Japanese + Japanese textbook

Course Coding	Year and Semester	Faculty Offering Course	Eligible Student Year	Credits	Weekday and Period
	2016whole year	Graduate School of Medical Sciences(22170)	1, 2, 3, 4	2	others

Course Title(Theme)	Instructor(s)
Special Lecture on Bioethics()	Kadooka Yasuhiro

Goals with their ratio
Under construction ・・・・100%

Type of Class	Lecture
Teaching Method	CITI e-learning system will be provided for classes on "reserch ethic"s. Classes of "highly advanced medicine" and "sicnce and society" are held in intensive courses. Various pedagogic strategies will be utilized including lectures, video, and e-learning.
Course Goals	This special lecture on bioethics will deal with ethical issues involved in developmental biology and regenerative medicine, which may be applications of organ transplantation, human stem cell research, iPS cell research, genetic diagnosis and therapy, and so on. This course is aimed to provide life science researchers with adequate knowledge and understanding concerning major bioethical issues to help them conduct sound researches.
Course Achievement Targets	To recognize various ethical, legal, and social issues and implications (ELSIs) and classic cases in the field of bioethics. To understand intrinsic problems involved in healthcare and medical research and discuss their significance. To acquire fundamental theoretical knowledge about biomedical ethics. To write and present their own bioethical arguments in a plausible manner. To read and critically analyze papers published in international journals in ethics and bioethics.
Outline	The course will consist of lectures concerning important bioethical issues and principles, small group discussion, and students' presentation. Participating students are required to critically read bioethical papers and present their own arguments.

Details for Individual Classes

No.	Date	Theme of Course	Brief Outline of Course
1		【1st grade】 Research ethics 1	CITI e-learning system
2		Research ethics 2	CITI e-learning system
3		Research ethics 3	CITI e-learning system
4		Research ethics 4	CITI e-learning system
5		Research ethics 5	CITI e-learning system
6		【2nd grade】 Highly advanced medicine 1	Brain Death and Organ Transplantation
7		Highly advanced medicine 2	Regenerative medicine and human cloning
8		Highly advanced medicine 3	Gene diagnosis and therapy
9		Highly advanced medicine 4	Assisted reproductive technology and Enhancement
10		Highly advanced medicine 5	Neuroethics
11		【3rd grade】 Science and Society 1	Professionalism of scientists
12		Science and Society 2	Social responsibilities of scientists
13		Science and Society 3	Scientific communication
14		Science and Society 4	Society and medicine 1 (healthcare policy, etc.)
15		Science and Society 5	Society and medicine 2 (Public health, etc.)

Textbooks/Materials	Textbooks are not specified and handouts are provided.
Reading List	Carl Mitchan (Editor in Chief) Encyclopedia of Science, Technology, and Ethics. Volume 1-4, Macmillan Reference USA, Thomson/Gale, 2005. Bonnie Steinbock (Edition) The Oxford handbook of Bioethics. Oxford University Press, 2007. Timothy F. Murphy Case Studies in Biomedical Research Ethics. The MIT Press, 2004. Karen F. Greif, Jon F. Merz Current Controversies in the Biological Science. The MIT Press, 2007. V. Ravitsky, A. Fiester, A. L. Caplan (eds). The Penn Center Guide to Bioethics (171-180), New York: Springer Publishing Company, 2009.
Enrollment Prerequisites	
Assessment Methods and Criteria	Students are evaluated for their course grades and credits based on the course hours completed, their understanding and knowledge earned about information in the research for bioethics, ability of summarizing and presenting bioethical deliberation of their own themes, and quality of hand-in report essays.Grading will be based on the student's understanding of the course subject matter. The students' understanding will be evaluated on the basis of short essays.
Language of Instruction	Instruction in Japanese + Japanese Textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22180)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Practice on Developmental Biology and Regenerative Medicine I(Practice "Enshuu" on Developmental Biology and Regenerative Medicine I)	OGAWA Minetaro, NISHIMURA Yasuharu, INOMATA Yukihiro, NAKAO Mitsuyoshi, ITO Takaaki

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	PBL, group work training
Class objectives	Developmental and regenerative medicine is an extremely interdisciplinary science that involves embryology, cell biology, molecular biology, genetics, immunology, histology, reconstructive surgery, bioethics and other broad fields of biosciences. Characterizing pathological conditions and etiology and developing medical treatment for diseases from the viewpoint of developmental biology, as well as establishing regenerative medicine in an effort to repair ageing and injured tissues and organs, may need to surmount various critical problems that should be related to above interdisciplinary fields. Based on the knowledge learned in the special lectures "Tokuron", this practice intends to enhance the ability of approaching solution of problems from a multilateral perspective by advancing quest for an arbitrarily-selected issue through successive examinations of literatures and discussions.
Goals	Students are expected to acquire the ability of approaching solution of problems from a multilateral perspective based on their knowledge in interdisciplinary fields.
Class outline	Students form a small group and raise an issue related to developmental and regenerative medicine. (An example of the issue might be finding a way to recover kidney function avoiding relying on dialysis treatment.) Students then find obstacles to settlement of the issue and examine literatures cooperatively with the group members and make discussions in order to explore methodology and strategy to solve the raised problems. The instructors listed above appropriately support the group work to facilitate learning. Results of the study are summarized in a report. Students will also have opportunities for the presentation of the results.

Each Summary			
No.	Date	Theme	Summary
1		----------	----------

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active participation in the group work as well as the final report and presentation. Focus of evaluation are (i) whether problems are appropriately raised from the selected issue, (ii) whether strategies to solve the problems are appropriately presented, (iii) whether both technical and ethical aspects are considered.
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22190)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Practice on Developmental Biology and Regenerative Medicine II(Practice "Enshuu" on Developmental Biology and Regenerative Medicine II)	OGAWA Minetaro, NISHIMURA Yasuharu, INOMATA Yukihiro, NAKAO Mitsuyoshi, ITO Takaaki

Goals with their ratio
Under construction ・・・・100%

Teaching Style	講義・演習
Class method	Students attend the seminars that are authorized by the course and write reports. The reports should include summary of the lectures and his/her own discussion about the topics. In principle, one hour seminar is suitable for one report.
Class objectives	Developmental and regenerative medicine is an interdisciplinary science that is rapidly evolving as a new field of life science. This practice consists of lectures from researchers who work on developmental biology and regenerative medicine in Japan and overseas. Researchers committed to cutting-edge research will be invited and present latest developments of their own. Students are encouraged to attend the seminars to acquire up-to-date knowledge of regenerative medicine and related fields that may not be covered in the special lectures "Tokuron".
Goals	Students are expected to acquire competence to understand the latest research developments of regenerative medicine.
Class outline	Topics of the seminars may encompass full range of issues that are related to developmental biology and regenerative medicine, including cell engineering, genetic engineering, biomedical materials, reproductive medicine and bioinformatics.

Each Summary

No.	Date	Theme	Summary
1		----------	----------

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are obligated to attend 15 or more lectures and submit reports. The attendance can be extended to four years at maximum. Grading will be based on the reports.
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22200)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Practice on Developmental Biology and Regenerative Medicine III(Practice "Enshuu" on Developmental Biology and Regenerative Medicine III)	OGAWA Minetaro, NISHIMURA Yasuharu, INOMATA Yukihiro, NAKAO Mitsuyoshi, ITO Takaaki

Goals with their ratio
Under construction ・・・・100%

Teaching Style	演習
Class method	Students attend domestic or international conferences on developmental biology, regenerative medicine and other related research fields, and present findings obtained from their own research.
Class objectives	During the process of conducting research on developmental and regenerative medicine, it is necessary to present research findings and discuss with other scientists at domestic and international conferences. This practice aims at expanding capability to make a productive discussion on a subject presented by other researchers and to present and discuss own findings in an effective manner at an academic conference.
Goals	Students are expected to acquire skills to make a productive discussion on a subject presented by other researchers and to present and discuss own findings in an effective manner at an academic conference.
Class outline	Students attend domestic or international conferences on developmental biology, regenerative medicine and other related research fields. In addition to discuss on the subjects presented by other researchers, students will present findings obtained from their own research in poster or oral sessions. The instructors listed above appropriately support discussions and preparations of presentation. Students finally write a report that includes the state of achievement of the activities at the conferences.

Each Summary

No.	Date	Theme	Summary
1		----------	----------

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students are obligated to attend and make a presentation in domestic or international conferences on developmental biology and regenerative medicine. Length of the activities at the conferences should be 4 days or more in sum total. Student should present their own research findings at least once in any of the conferences they attend. The attendance can be extended to four years at maximum. Grading will be based on the final report.
Language of instruction	lecture in English + English textbook

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22210)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Practical Training of Developmental Biology and Regenerative Medicine(Practical Training “Jisshuu" on Developmental Biology and Regenerative Medicine)	OGAWA Minetaro, Tomizawa Kazuhito, SHIMAMURA Kenji, NISHIMURA Yasuharu, NAKANISHI Hiroyuki, Sou Bunketsu, OGURA Teru, Oota Kunimasa, NAKAO Mitsuyoshi, Senjiyuu Satoru, Itou Takaaki, NISHINAKAMURA Ryuichi, Saitou Noriko, ESAKI Masatoshi, UMEDA KAZUAKI, Hatakeyama Jiyun, Niimori Kanako, Sakamoto Yasuhisa

Goals with their ratio
Under construction ・・・・100%

Teaching Style	実習
Class method	Each training course will be held in a laboratory in charge. First, the principle of a method or a technique will be lectured, then practical handling will be trained. Results and discussions must be surmmarized in a report.
Class objectives	Various experimental methods and techniques are applied in the field of developmental biology and regenerative medicine, which is an interdisciplinary research based on cell biology, molecular biology, immunology and histology. For researchers in the field, it is required to learn such experimental methods and techniques practically. Even for researcher outside the filed, it is important to understand a background of the experimental methods and techniques, since it gives us a multilateral viewpoint and would support to resolve various problems in specific research fields. Principles and practical procedures for several important experimental methods and techniques were trained in practical training of Developmental Biology and Regenerative Medicine.
Goals	Students are expected to acquire competence to understand principles and practical procedures for several important experimental methods and to perform them by themselves.
Class outline	・Scanning electron microscopy（Brain Morphogenesis） ・Time-lapse imaging of living culture cells（Molecular Pharmacology） ・Induction of immunocytes from ES cells（Immunogenetics） ・Handling of developing neural tissues and cells（Developmental Neurobiology） ・Histological stain and its interpretation（Pathology and Experimental Medicine） ・ Fractionation and isolation of cells by FACS（Cell Differentiation） ・ Isolation of RNA/DNA and quantification by PCR（Medical Cell Biology） ・ Operant conditioning test, Open field test, Fear-conditioning test （Molecular Physiology） ・Two-photon fluorescence microscopy for neurons（Sensory and Cognitive Physiology） ・ Lipofection, Western blot（Kidney Development） ・ Induction of protein expression in bacteria, protein purification（Molecular Cell Biology） In this course, sessions in Practical Training of Metabolism and Cardiovascular Medicine could also be selected.

Each Summary

No.	Date	Theme	Summary
1		Schedule of each session will be forwarded to you separately.	Contents of each session will be forwarded to you separately.

Required Textbooks	
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Students must participate in at least 8 sessions and submit reports for each session. Grading will be based on the student's understanding of the subject matter as well as activities in the classes. The students' understanding will be evaluated on the basis of reports to be scored from 0 to 100 for each session. Final grades will be based on the average of the top 8 scores.
Language of instruction	lecture in English + English textbook

13. Endocrinology and Metabolism Course

Class numbering code	Semester	Course belonging/Course code	Year/Grade	Credit	Day,Period
	2016whole year	Graduate School of Medical Sciences(22250)	1, 2, 3, 4	2	other

Course name(Theme)	Instructor
Practical Training of Metabolic Medicine()	Yuichi Oike, Takahiko Kato, Hirotaka Matsui, Shokei Mitsuyama, Kazuya Yamagata, Seiji Hokimoto, Yoshihiro Komohara, Tomohiro Sawa

Goals with their ratio
Under construction ‥‥100%

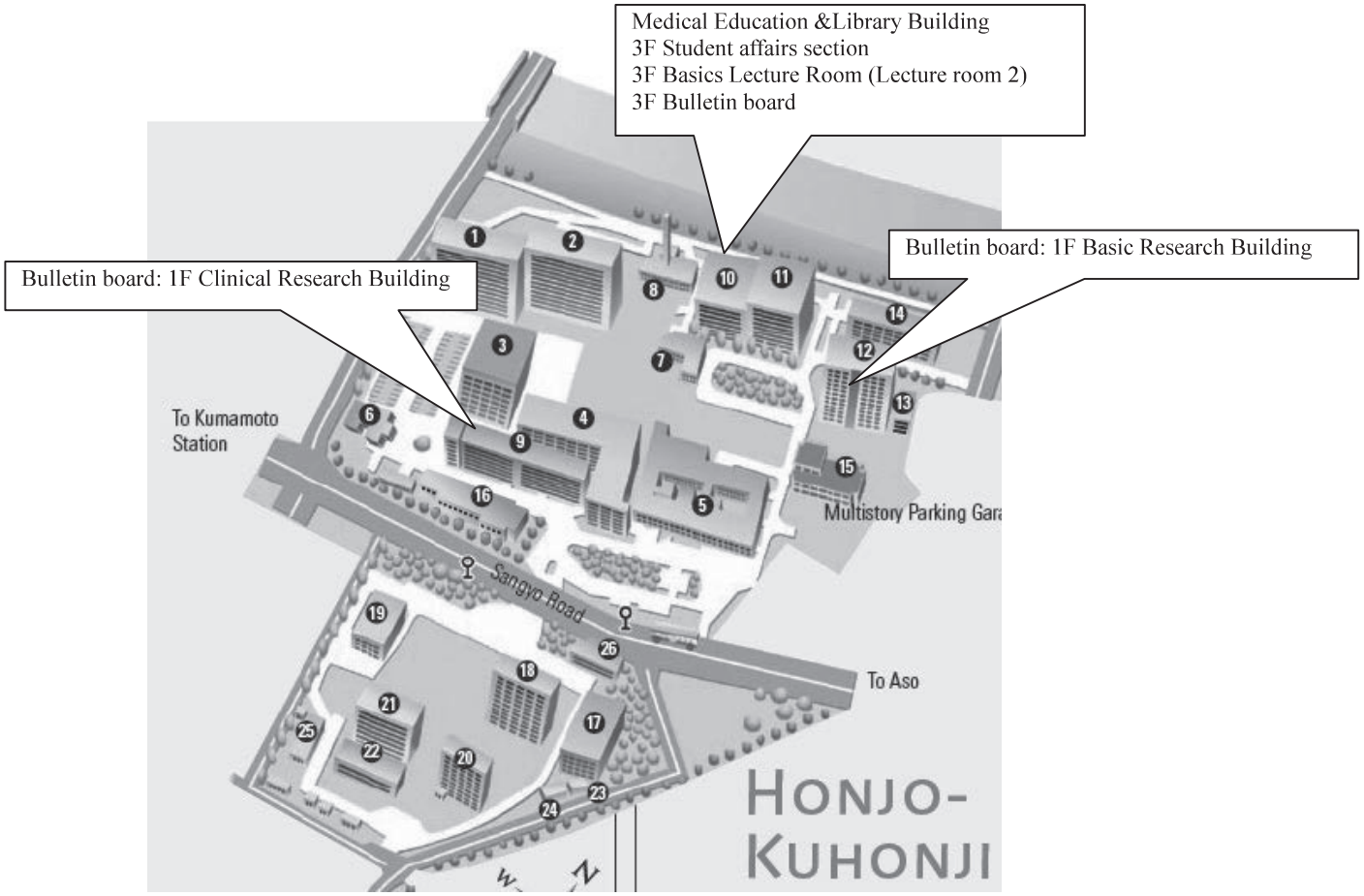
Teaching Style	実習
Class method	Each training course will be held in a laboratory in charge. First, the principle of a method or a technique will be lecureted, then practical handling will be trained. Results, which will be discussed, must be surmarized in a report.
Class objectives	Various experimental methods and techniques are applied in the field of Metabolism and Cardiovascular Medicine, which is an interdisciplinary research based on epidemiology, internal medicine, pathology, pharmacology, histology and cell biology. For researchers in the field, it is required to learn such experimental methods and techniques practically. Even for researcher outside the filed, it is important to understand a background of the experimental methods and techniques, since it gives us a multilateral viewpoint and would support to resolve various problems in spesific research fields. Principles and practical procedures for several important experimental methods and techniques were trained in practical training of Metabolism and Cardiovascular Medicine.
Goals	Principles and practical procedures for several important experimental methods and techniques were trained in practical training of Metabolism and Cardiovascular Medicine.
Class outline	Following methods and techniques are trained: ・Introduction of epidemiology: Epidemiological and statistical analysis (Public Health) ・Introduction of metabolic analysis: Method of analyzing metabolic disease (Molecular Laboratory Medicine) ・Metabolic analysis 1: Blood pressure and cardiac rate (Pharmacology and Molecular Therapeutics) ・Metabolic analysis 2: Blood insulin (Medical Biochemistry) ・Metabolic analysis 3: Whole body metabolism, CT (Molecular Genetics) ・Metabolic analysis 4: Cardiovascular disease model (Cardiovascular Medicine) ・Histological analysis: Histopathology, Immunohistochemistry (Cell Pathology) ・Oxidative stress analysis: Measurements of reactive oxygen species (Microbiology) In this course, sessions in Practical training of Developmental Biology and Regenerative Medicine also could be selected.

Each Summary			
No.	Date	Theme	Summary
1		Introduction of epidemiology	Epidemiological and statistical analysis (Public Health)
2		Introduction of metabolic analysis	Method of analyzing metabolic disease (Molecular Laboratory Medicine)
3		Metabolic analysis 1	Blood pressure and cardiac rate (Pharmacology and Molecular Therapeutics)
4		Metabolic analysis 2	Blood insulin (Medical Biochemistry)
5		Metabolic analysis 3	Whole body metabolism, CT (Molecular Genetics)
6		Metabolic analysis 4	Cardiovascular disease model (Cardiovascular Medicine)
7		Histological analysis	Histopathology, Immunohistochemistry (Cell Pathology)
8		Oxidative stress analysis	Measurements of reactive oxygen species (Microbiology)

Required Textbooks	Textbooks are not specified, and handouts for each practice will be distributed.
Reading list	
Information concerning enrollment	
Assessment methods and criteria/ratios	Grading will be based on active class participation and discuttion and the final report. In the report, results and comments concerning at least 8 sessions sould be summarized in one or two A4 sheets.
Language of instruction	lecture in Japanese + Japanese textbook

14. Campus map and lecture room location

Honjo Campus



1. West Tower
2. East Tower
3. Central Examination Building
4. Outpatient Examination and Clinical Research Building
5. Administration Building
6. Yamazaki Hall
7. Former Emergency Building
8. Facility Management Building
9. Clinical Research Building
10. Medical Educational & Library Building
11. General Medical Research Building
12. Basic Research Building
13. The Center for Medical Education and Research
14. Dormitory for Nurses
15. Multistory Parking Garage 1
16. Multistory Parking Garage 2
17. Institute of Resource Development and Analysis (Center for Animal Resources & Development)
18. Center for AIDS Research, Institute of Resource Development and Analysis
19. Lecture Building
20. Institute of Molecular Embryology and Genetics
21. Institute of Resource Development and Analysis (Gene Technology Center / Radioisotope Center)
22. Academic Common Honjo-1
23. Club Room
24. Club Room
25. Club Room
26. Higo Iiku Monument Hall