Doctoral Program

Graduate School of Medical and Dental Sciences

Syllabus

２０１５

Tokyo Medical and Dental University

Doctoral Program：Medical and Dental Sciences

Index

Initial Research Training
(for international students)

（Code : 3 1 0 2　1st year　1 unit）

[Course Description]

Research work should be done in accordance with various rules and regulations including those related to ethics, and those related to handling of toxic substances, radioactive materials and animals. This series of lectures introduce rules and regulations that the students should follow during research work. Also, the students learn how to use libraries and data bases, and how to avoid scientific misconducts.

[Grading]

Attendance

[Course Schedule]

See the next page; Table

[Notes]

If you register “Initial Research Training”, you must choose one “for Japanese” (Code: 3002) or “for international students” (Code: 3102).

If you are the Japanese or the international students who are fluent speakers of Japanese, you should be advised to take part in “Initial Research Training for Japanese” (Code: 3002).

[Inquiring]

Educational Planning Section
TEL 5803-4679,4676

Initial Research Training FY2015
Graduate School of Medical and Dental Sciences

Date : Mon. 20th April to Fri. 24th April 2015

Venue: Lecture Room 3, 11th floor, M&D Tower (Excluding lectures with *1)

Timetable :

date	First (14:40～15:40)	Second (15:50～16:50)	Third (17:00～18:00)
20-Apr Mon.	Ethics of Researcher Sachiko ISEKI Molecular Craniofacial Embryology Professor	Thesis Writing and Presenting Research Cannell David Richard International Exchange Center Associate Professor	Methods for studying the development *2 Hiroshi NISHINA Developmental and Regenerative Biology Professor
21-Apr Tue.	Environment and safety in research Takao HANAWA Metallic Biomaterials Professor	To conduct a safe and fair research *2 Hirobumi TERAOKA Office for Research Safety and Management Professor emeritus	How to make scientific researches reliable and successful Tetsuya TAGA Stem Cell Regulation Professor
22-Apr Wed.	Mass spectrometry for protein analysis Takeshi KASAMA Instrumental Analysis Research Division Associate Professor	Use and Handling of Radioisotopes and Radiations Masayuki HARA General Isotope Research Division Associate Professor	Study of Functional gene and genome Masataka NAKAMURA Human Gene Sciences Research Division Professor
23-Apr Thu.	The Design of Animal Experiments Hitomi SUZUKI Experimental Animal Model for Human Disease Assistant Professor	Immunology in Medical Research Mari KANNAGI Immunotherapeutics Professor	Biosafety and basic microbiological techniques *2 Shoji YAMAOKA Molecular Virology Professor
24-Apr Fri.	Bioethics *2 Masayuki YOSHIDA Life Science and Bioethics Research Center Professor	Collaborative Institutional Training Initiative JAPAN program *2 Masayuki YOSHIDA Life Science and Bioethics Research Center Professor	Literature search・Utilization of library *1 Atsuhiro KINOSHITA Institute for Library and Media Information Technology Professor

*1: Venue: 4th floor, M&D Tower

*2: Video Screening

Basic-Clinical Borderless Education

Lecture (Code: 8603, 1st ～2nd year: 6units)

1. Instructors:

Contact person: Sachiko ISEKI E-mail s.iseki.emb@tmd.ac.jp

2 Description and Timetable

This course consists of "course lectures" and "research progress meeting". At the end of the course, understanding and exploring the interrelation between the basic and clinical research is achieved.

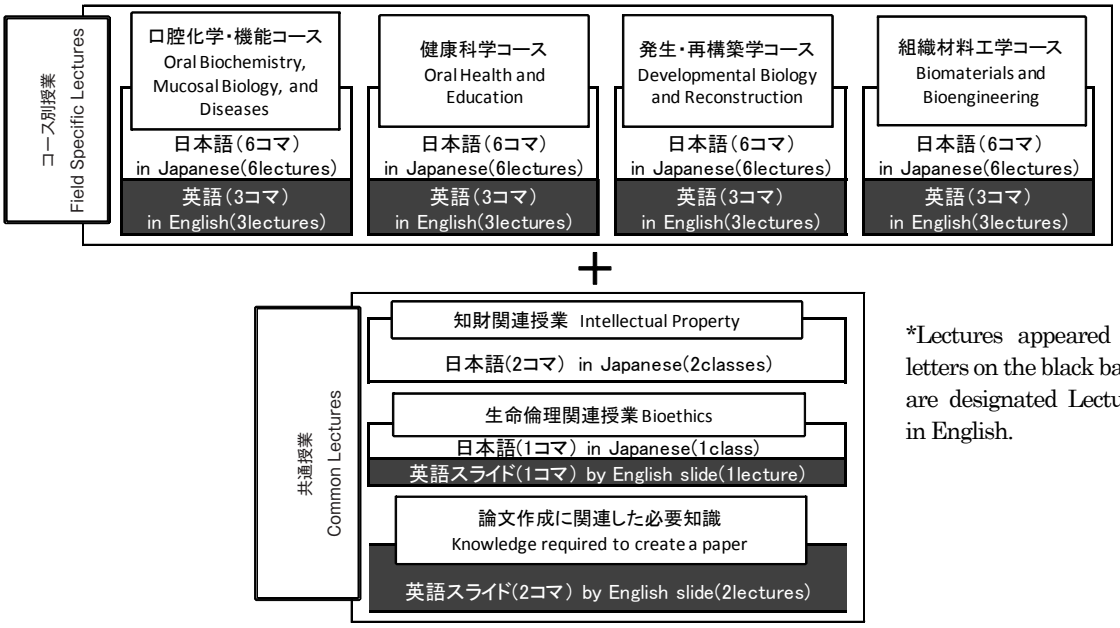
Course Lectures

Outline:

Students who take this course will select one of following five lecture series.

- Oral Biochemistry, Mucosal Biology and Diseases
- Oral Health and Education
- Developmental Biology and Reconstruction
- Biomaterials and Bioengineering
- Lecture Series in English

Each lecture series comprises 9 field specific lectures and 6 common lectures. Lecture series in English is composed of three lectures held in English from each research field (total 9 lectures) and 6 common lectures in which the slides are presented in English.



*Lectures appeared in white letters on the black background are designated Lecture Series in English.

Each lecture series provides current topics in the research field with the interest in the methods, basic study and the possibility of clinical application.

Common lectures are set up for understanding the bioethics, intellectual properties and the basics knowledge required for conducting the research.

For the detail of the lectures including the schedule, venues, please check the website and bulletin board.

Research progress meeting

Outline:

Our program adopted a "Three supervisor system". For each student, the main supervisor and two sub-supervisors are selected from both basic and clinical teaching staffs.

The three supervisor system works to improve research plans and directions of the student by holding regular discussions, and supports students to write papers (thesis).

By the middle of 2nd year grade three supervisors are selected according to the research theme of each student. A notice of research progress meeting is issued by Educational Planning Section twice a year and students arrange their meeting with their supervisors. After the meeting, a report with the fixed form is submitted to Educational Planning Section. The submission deadline is the end of July and December. The submission of the report is required for credit earning, and the data is used to verify the research progress and focus on problems.

Note:

In case of postponement of the research progress meeting, consult with the main-supervisor and inform Educational Planning Section. Change of the supervisor shall be discussed with the professor of affiliated section and informed to Educational Planning Section. Research progress meeting is carried out until completion of writing the manuscript.

3. Course Format:

Course Lectures and group discussion (research progress meeting)

4. Venue:

For venues and other detailed information, please check the website and bulletin board.
For the research progress meeting, the students arrange the venue by themselves.

5. Grading:

Evaluation will be given according to the participation in the lecture series and report submission of the research progress meeting. The research progress meeting report needs to be submitted more than once by the end of 2nd year,.
Course outline is introduced at the first lecture of each lecture series, therefore registered students are asked to attend it.

6. Notes:

For detailed information, please check the website and bulletin board.
URL　http://www.tmd.ac.jp/dent/cell/borderless/seminar/course.html

Holistic Study of Disease Prevention I

(Code: 6302 1st year 1 units)

1. Instructors:

Contact person: Yoshihiro Takemoto, Ph.D., Professor TEL +81-3-5280-8134
E-mail takemoto.mech@tmd.ac.jp

	Name	Course/ Title	Contact Information
Chief Instructor	Yoshihiro Takemoto	Institute of Biomaterials and Bioengineering, TMDU / Professor	takemoto.mech@tmd.ac.jp
	TBD	TBD	

2. Classroom/Lab

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3. Course Purpose and Outline

Course Purpose

Acquiring an overview of disease prevention sciences.

Outline

This lecture course offers an overview of various disciplines ranging from medicine to sociology, enabling students gain an overall grasp of each subject and extensively study current issues surrounding disease prevention sciences.

4. Course Objective(s)

This course will provide a broad-based education that helps to develop a comprehensive overview of the field of Disease Prevention Sciences.

5. Format

The leading experts in disease prevention science will be invited and the course will focus on student participation and discussion (small discussion groups will be arranged round-table style).

6. Course Description and Timetable

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7. Grading System

Participation (40%), question and answer (30%), and reports (30%).

8. Prerequisite Reading

None. However, there may be reference texts and essays announced before lessons.

9. Reference Materials

References may be introduced by instructors prior to their lectures.

10. Important Course Requirements

Attendance is mandatory for interactive course learning.

11. Office hours

Weekdays only: Students must e-mail Yoshihiro Takemoto in advance in order to make an appointment.

12. Note(s) to students

Due to the style of this course, enrollment will be limited, with priority given to Disease Prevention Science Course (DPSC) students. In this course, several visits to research labs will be carried out. Research lab visits refer to a teaching style wherein students visit the university or research lab of the instructor for the lesson and take a tour of the research facility and research labs in addition to the lesson.

Through research lab visits, students will be able to widen their perpsectives and make vital networking for their future.

Schedule

No	Day Time	Topics Venue	Instructor
1	Wed., 4 Nov 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
2	Wed., 11 Nov 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
3	Wed., 18 Nov 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
4	Wed., 25 Nov 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
5	Wed., 2 Dec 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
6	Wed., 9 Dec 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
7	Wed. 16 Dec 19:00～20:30	TBD (Floor 1, Building 22.)	TBD
8	Wed., 13 Jan 19:00～20:30	TBD (Floor 1, Building 22.)	TBD

Overview of Public Health Medicine in Disease Prevention

Lecture (code: ８６０６ one of the 1st～3rd :2units)

1. Instructor(s)

	Name	Department	Contact Information
Chief Instructor	Nobuo Ohta	Environmental Parasitology	matata.vip@tmd.ac.jp
Instructors	Keiko Nakamura	International Health and Medicine	
	Yoshinobu Eishi	Human Pathology	
	Shoji Yamaoka	Molecular Virology	
	Kazuki Takada	Professional Development in Health Sciences	
	Masayuki Yoshida	Life Sciences and Bioethics	
	Masashi Kizuki	Health Promotion	
	Kaoruko Seino	International Health and Medicine	

2. Classroom/Lab

6th Floor, Building 3

3. Course Purpose and Outline

This course offers a general introduction to public health medicine, addressing fundamental topics and basic measures required for a global leader in disease prevention. The course focuses on development of essential knowledge and skills for global disease prevention through lectures and discussions based on selected case studies.

4. Course Objective(s)

At the end of the course, participants will be able to:
1) Describe the roles and responsibilities of public health in disease prevention
2) Describe the global distribution and causes of major diseases, injuries and health risk factors, and the main prevention and control strategies
3) Describe and apply the basic principles and methods of medical research to disease prevention
4) Describe the main ethical issues in international medical research
5) Describe cross-border health issues in relation to globalization

5. Format

Lectures, group discussions, and team project. All programs are conducted in English.
International students and Japanese students attend the same class and use English in the classroom.
Students from the Medical and Dental Science or Biomedical Science departments are both welcome to the course.

6. Course Description and Timetable

	Day Time	Topics	Instructor
1.	Tuesday, 10 Nov, 2015 16:00-17:30, 17:40-19:10	Health and environment	Nobuo Ohta
2.	Tuesday, 17 Nov, 2015 16:00-17:30, 17:40-19:10	Global public health	Keiko Nakamura
3.	Tuesday, 24 Nov, 2015 16:00-17:30, 17:40-19:10	Health promotion	Masashi Kizuki
4.	Tuesday, 8 Dec, 2015 16:00-17:30, 17:40-19:10	Prevention and control of cancer	Yoshinobu Eishi
5.	Tuesday, 15 Dec, 2015 16:00-17:30, 17:40-19:10	Prevention and control of communicable disease	Shoji Yamaoka
6.	Tuesday, 5 Jan, 2016 16:00-17:30, 17:40-19:10	Ethics in medical research	Masayuki Yoshida
7.	Tuesday, 12 Jan, 2016 17:00-18:30, 18:40-20:10	Global communication and leadership (Venue: G-Lab, 8th Floor south, M&D Tower)	Kazuki Takada
8.	Tuesday, 19 Jan, 2016 16:00-17:30, 17:40-19:10	Prevention and control of non-communicable disease	Kaoruko Seino

7. Grading System

Grades are based on attendance at lectures, performances on assigments, and levels of attitude, skills and knowledge.

8. Prerequisite Reading

When reading materials are distributed or specified in advance, participants are expected to read those materials beforehand.

9. Reference Materials

To be announced before or during individual classes, when relevant.

10. Important Course Requirements

This is a required course for students of "Disease Prevention Global Leader Program (DP-GLP)". PhD candidates at departments of Medical and Dental Science and Biomedical Science who are enrolled in this program through a special selection must attain credits from this course.
PhD candidates of general selection at departments of Medical and Dental Science and Biomedical Science can also participate in this course.

11. Availability in English

Students and instuructors use English through the course.

12. Office Hour

Please contact Prof. Nobuo Ohta at matata.vip@tmd.ac.jp

13. Note(s) to students

Both international and Japanese students participate in the same program provided in English and learn together on public health medicine in disease prevention. The couse is a core part of nuturing global leaers in disease prevention that TMDU provides.

Oral Pathology

Lecture	(code:	８０１１	1st year	:6units)
Practice	(code:	８０１２	1st～2nd year	:4units)
Lab	(code:	８０１３	2nd～3rd year	:8units)

1. Instructor(s)

Lecturer: Kei Sakamoto, Assistant Professor: Kou Kayamori

2. Classroom/Lab

Conference Room, Dept of Oral Pathology, Build No.1 East, 4th floor

3. Course Purpose and Outline

The objective of this course is to provide graduate-level instruction in oral pathology.

4. Course Objective(s)

The goal of this course is to acquire a foundation for understanding the pathobiology of various diseases on conventional morphological and molecular biological bases.

5. Format

Journal club and research presentation and practice.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:The goal of the lecture is to acquire a foundation for understanding the pathobiology of various diseases on conventional morphological and molecular biological bases.

Available programs:

Journal club. Oct 7 - Nov 25, every Wednesday, 10:30-12:00

Practice

Goals/Outline:The goal of the practice is to expand the understanding the pathobiology of various diseases on conventional morphological and molecular biological bases.

Available programs:

None

Lab

Goals/Outline:The goal of the lab is to acquire a foundation for understanding the pathobiology of various diseases on conventional morphological and molecular biological bases.

Available programs:

None

7. Grading System

Comprehensive assessment based on participation and activity in lectures.

8. Prerequisite Reading

None required.

9. Reference Materials

Provided on request to the lecturer.

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Wed 10:30-12:00

13. Note(s) to students

None

Bacterial Pathogenesis

Lecture	(code:	1st year	:6units)
Practice	(code:	1st～2nd year	:4units)
Lab	(code:	2nd～3rd year	:8units)

1. Instructor(s)

2. Classroom/Lab

Not offered

Molecular Immunology

Lecture	(code:	８０３１	1st year	:6units)
Practice	(code:	８０３２	1st～2nd year	:4units)
Lab	(code:	８０３３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Miyuki AZUMA, Associate Professor Shigenori NAGAI, Assistant Professor Tatsukuni OHNO
Contact person: Department of Molecular Immunology Miyuki AZUMA E-mail: miyuki.mim@tmd.ac.jp

2. Classroom/Lab

M&D tower, 6F Seminar room 11

3. Course Purpose and Outline

To understand how immune systems contrbute to healty and disease status and also to learn how to control immune-mediated diseases.

4. Course Objective(s)

To explain systemic and organ-specific immune responses and to bring idesa how to control immune diseases

5. Format

Presentation by a small group and comprehensive discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Every Monday from January 18 to March 7, 17:00 -19:00
Select several immunology reviews in 2015 immunology topics, read by a small group,and then present and discuss by all class

Available programs:

Special Lecture 2 times (during the above lecture period)
Journal Club Odd Week Saturday 15:30-17:30

Practice

To understand basic and update technology of immunological research and to try to make own study plan

Available programs:

Lecture Monday from January 18 to March 7, 17:00 -19:00, Special Lecture 2 times during the lecture period
Journal Club Odd Week Saturday 15:30-17:30

Lab

To acquire fundamental techniques for immunological research.
To make own study plan and to practice own study

Available programs:

Lecture Monday from January 18 to March 7, 17:00 -19:00, Special Lecture 2 times during the lecture period
Journal Club Odd Week Saturday 15:30-17:30

7. Grading System

Comprehensive assessment

8. Prerequisite Reading

must review the things that you has learned in ubdergraduate Immunology classes

9. Reference Materials

Cellular and Molecular Immunology （Seventh Edition） Elsevier Saunders

10. Important Course Requirements

All lecture, presentation and discussion are provided in English.

11. Availability in English

Available

12. Office Hour

17:00-19:00 Miyuki AZUMA miyuki.mim@tmd.ac.jp Shigenori NAGAI nagai.mim@tmd.ac.jp Tatsukuni OHNO tohno.mim@tmd.ac.jp

13. Note(s) to students

None

Advanced Biomaterials

Lecture	(code:	８０４１	1st year	:6units)
Practice	(code:	８０４２	1st～2nd year	:4units)
Lab	(code:	８０４３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Motohiro UO, Associate Professor: Toshio HONGO, Assistant Professor: Takahiro WADA
Part-time senior lecturer: Atsunobu Masuno
Contact person: Motohiro UO E-mail: uo.abm@tmd.ac.jp

2. Classroom/Lab

Please contact the faculty adviser before attending class.

3. Course Purpose and Outline

Study about the progress and the various properties advanced biomaterials and dental materials.
In addition, study about the measurement and analysis methods of advanced biomaterials and dental materials.

4. Course Objective(s)

Acquire the knowledge about the biomedical and dental materials

5. Format

All coerces are basically few people education system for providing free discussion.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Upon successful completion of the course, the student will be able to:
1. Describe the basic classification of dental materials
2. Understand basic characteristics of recent dental materials
3. Explain current scientific theory regarding evaluating mechanical properties
4. Discuss characteristics of recent representative oral biomaterials and equipment.

Available programs:

Lecture Thursday morning, 10:30 am - 12 am (June and July)
Special Lecture As needed (announced if necessary)

Practice

Goals/Outline:
Students will be able to explain their research results using PowerPoint.
Students will be able to display their research results as a poster presentation.
Student will be able to discuss their findings with other students.

Available programs:

As needed

Lab

Goals/Outline:
Students should measure basic mechanical properties using testing machine.
Students should determine several hardness values of dental materials.
Student should analyze crystalline component using X-ray diffractometer
Student should analyze atomic vibration using Fourier-transfer-infrared-scopy.

Available programs:

Participation in a research group As needed

7. Grading System

Comprehensive assessment based on participation, report for lecture, activity for the academic meeting.

8. Prerequisite Reading

Prerequisite reading will be requested, if necessary

9. Reference Materials

Phillip's Science of Dental Materials 11th ed. (Annusavice K, Saunders, 2003)

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

uo.abm@tmd.ac.jp

13. Note(s) to students

None

Diagnostic Oral Pathology

Lecture	(code:	８０５１	1st year	:6units)
Practice	(code:	８０５２	1st～2nd year	:4units)
Lab	(code:	８０５３	2nd～3rd year	:8units)

1. Instructor(s)

Asso. Professor: Toshiyuki IZUMO, Visiting lecturer: Hisao YAGISHITA, Taisuke MORI

2. Classroom/Lab

Clinical Lab. Conference Room, Dental Hosp. 6F. (Since it changes with programs, check with the teacher in charge before attendance.)

3. Course Purpose and Outline

Acquire the fundamental pathological capability for advancing diagnosis, treatment and research about oral lesions.

4. Course Objective(s)

An attainment target is putting on the fundamental pathological capability and attitude, and the posture for advancing diagnosis, treatment and research about oral lesions.

5. Format

In principle, the discussion form of a small number people or 1 to 1 system.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline: The fundamental view about oral cancer and the concrete procedure of dealing with it are explained in lecture form.

Available programs:

Graduate school lecture: June 3 – July 8 (5 times) Wednesday 16:00 to 17:30
Classroom seminar: At any time
Oral surgery and pathology clinical conference: 1 time per month Wednesday 18:30 to 19:00

Practice

Goals/Outline: An attainment target is putting on pathological capability required as an oral pathologist.
We teach by dealing with cases, such as a biopsy, operation specimen, cytodiagnosis and autopsy, together.

Available programs:

Medical meeting of oral tumors: 1 time of every month Tuesday 19:00 to 21:00
Clinico-pathological conference: Every week Tuesday 17:00 to 19:00
Clinico-pathological conference: Every week Tuesday 9:30 to 11:00

Lab

1. The clinicopathologic research of oral cancer.
2. The elucidation of pathogenesis in molecular-pathological analysis of oral diseases.
3. The development of new diagnostic method of oral lesions.

7. Grading System

The participating situation to a lecture, an exercise, and research training and participation situations, such as an announcement and an utterance, are judged and evaluated.
In addition, synthetic evaluation is performed based on the details of research, the grade of various researches or the intervention to a research conference, the number of times of a society announcement, etc.

8. Prerequisite Reading

The diagnostic exercise of biopsy, operation, cytology and autopsy cases is actually considered based on the knowledge about general and oral pathology. Strive for acquisition of exact systematic knowledge.

9. Reference Materials

1) Rosai and Ackerman!'s Surgical Pathology, 10th (Elsevier).
2) Diagnostic Surgical Pathology of the Head and Neck, Sec. ed (Saunders).
3) Oral Cancer: Diagnosis and Therapy, (Springer).

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Diagnostic Oral Pathology, Toshiyuki IZUMO: E-mail Izumo.dlab@tmd.ac.jp

13. Note(s) to students

None

Organic Biomaterials

Lecture	(code:	８０６１	1st year	:6units)
Practice	(code:	８０６２	1st～2nd year	:4units)
Lab	(code:	８０６３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Nobuhiko YUI, and Assistant Professor Atsushi TAMURA
Contact person: Nobuhiko YUI E-mail yui.org@tmd.ac.jp

2. Classroom/Lab

To be announced.

3. Course Purpose and Outline

To understand the basis of organic biomaterials and discuss a variety of functionality requred for advanced biomaterials.

4. Course Objective(s)

To acquire the abilty to find and solve problems in the course of basic studies on organic biomaterials.

5. Format

To do either in a didactic manner or in reading references in turns, and to give any opportunity for mutual discussions.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The progress in nano-biotechnology controlling the organization of nano-scaled assemblies in molecular levels is indispensable to the development of novel biomaterials for the next generation. In this lecture, basic concept of polymeric biomaterials will be introduced for understanding the medical applications of nano-materials. Also, recent topics on advanced medicines including drug delivery systems and regenerative medicine will be discussed.

Available programs:

Every Wednesday from 16:00 to 18:00 (Nov. 11th - Dec. 16th, 2015)

Practice

Goals/Outline:
To research recent studies on biomaterials for learning more about advanced investigation and training logical thinking for the research works.

Available programs:

Every Wednesday from 16:00 to 18:00 (Nov. 11th - Dec. 16th, 2015)

Lab

Goals/Outline:
To evaluate the functionalities of a variety of biomaterials designed in the laboratory in terms of their final goals in the fields of drug delivery and regenerative medicine. For example, to characterize nano-biomaterials, investigate the properties in drug delivery performance, and evaluate the cellular interaction with these biomaterials.

Available programs:

Every Wednesday from 16:00 to 18:00 (Nov. 11th - Dec. 16th, 2015)

7. Grading System

To evaluate both the attendance (the lecture, practice and lab.) and the score of the reports submitted.

8. Prerequisite Reading

To prepare oral presentation of a certain topics on organic biomaterials with powerpoint files as the topics are to be announced in either lecture or practice.

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Please contact Prof. Nobuhiko Yui (e-mail: yui.org@tmd.ac.jp).

13. Note(s) to students

None

Functional Material

Lecture	(code:	８０７１	1st year	:6units)
Practice	(code:	８０７２	1st～2nd year	:4units)
Lab	(code:	８０７３	2nd～3rd year	:8units)

1. Instructor(s)

Tsuyoshi Kimura
Contact person: Tsuyoshi Kimura E-mail kimurat.mbme@tmd.ac.jp

2. Classroom/Lab

Lecture room will be informed by contact person.

3. Course Purpose and Outline

This course deals with medical materials and devices. Designing medical devices for realizing bio-function and their application are introduced through recent outcome from advanced research field.

4. Course Objective(s)

The goal of this course is to understand concept, characteristics and application of various medical materials and the devices and to learn how to control them.

5. Format

Start-up training is available. Afterwards, students will be asked to do practice by themselves.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The objective is to understand the materials, especially polymeric materials, for medical use. In the lecture, material characterization, scaffold for regenerative medicine and tissue engineering, synthetic vector for drug and gene therapy and stem cell engineering are introduced and explained.

Available programs:

Lecture Monday, 18:00-20:00, Oct.19th-Dec.30th

Practice

Goals/Outline:
The objective is to understand how novel polymeric materials are studied and developed, and to learn how to read, summarize, and write a research paper. Survey of newly published paper related to new materials will be done as required. Student will be asked to read and explain the paper in the research group seminar.

Available programs:

Seminar Thursday, Every week, 17:00-20:00

Lab

Goals/Outline:
The objective is to learn the skill necessary for the research of students own (Contents are; polymer synthesis, characterization, cell culture and animal experiment)

Available programs:

Participation in a research group Any time

7. Grading System

Grading is comprehensively judged from attendance and research achievement.
Attendance and participation to Practice and Lab(minimum requirement is 60%): 80%
Presentation in Society Meeting or Publication(minimum requirement is once): 20%

8. Prerequisite Reading

Learn about the text that was instructed by Lab stuffs (articles, text book, etc.)

9. Reference Materials

Ratner et al. eds., Biomaterials Science, Academic Press
Lanza et al., eds., Principles of Tissue Engineering, Academic Press

10. Important Course Requirements

Student will be asked to manage themselves, because one should do chemical and biological experiments which takes long time. Consult with lab stuff frequently.

11. Availability in English

None

12. Office Hour

Monday to Friday, 9:00-18:00

13. Note(s) to students

None

Oral Radiation Oncology

Lecture	(code:	８０８１	1st year	:6units)
Practice	(code:	８０８２	1st～2nd year	:4units)
Lab	(code:	８０８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Masahiko MIURA
Contact person Masahiko MIURA E-mail masa.mdth@tmd.ac.jp

2. Classroom/Lab

Make sure by contacting me before each lecture or seminar

3. Course Purpose and Outline

To understand cutting edge of radiation biology and radiation oncology

4. Course Objective(s)

To understand the concept and reserch trend of translational reserch regading radiation oncology

5. Format

To give lectures and practice to a small number of students.
To cultivate ability to extract problems and constitute your own idea through discussions.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Oral Radiation Oncology is a branch of radiation oncology dealing with basic radiobiology, translational research, and radiotherapy for oral cancer. Main objective of this branch in the graduate course is to provide opportunities to study biological strategies for radiosensitization, development of radiosensitizers, molecular mechanisms of tumor radioresistance, the state of the art technology of radiotherapy, and basis of individualized radiotherapy depending on each student's research projects.

Available programs:

Lecture Oct. 15- Dec. 24, 2015 on every Tuesday 8:00am-9:30am
Molecular Biology for Radiation Oncology
Semier At anytime
Special Lecture At anytime
Journal Club On every Tuesday 8:00am-9:00am
Research in Progress At anytime
Special Lecture 1 week(around the end of Sep.)
at Tamachi Campus, Tokyo Institute of Technology
Training Program for Specialists in Cancer:Radiation Biology Course

Practice

Goals/Outline:
The outline of Practice is to diagnose varying types of the primary and locoregional sites of oral cancer and to learn how to treat them by radiotherapeutic modalities including 3D-conformal radiotherapy, brachytherapy, and multidisciplinary treatments.

Available programs:

Clinical Conference 1 On every Friday 16:30-17:00
Clinical Conference 2 On Friday (once/month) 18:00-18:30

Lab

Goals/Outline:
The outline is to learn basic techniques required for our research themes (tissue culture techniques, X-ray irradiation, radiation dosimetry, Western blotting, gene transfer, real time imaging using fluorescent proteins, etc.)

Available programs:

Participate in each research group

7. Grading System

Totally evaluate students' achievements based on the presence to lectures or seminars, presentation in seminars, reports regading their research, and presentation in academic meetings, etc.

8. Prerequisite Reading

Read the reference material described below and grassp the outline

9. Reference Materials

"Radiobiology for the Radiologist 7th ed" Lippincott Williams & Wilkins, Eric J Hall and Amato J Giaccia eds.

10. Important Course Requirements

None

11. Availability in English

Available(on request)

12. Office Hour

Prof. Masahiko MIURA : Mon through Fri 16:00-18:00 masa.mdth@tmd.ac.jp

13. Note(s) to students

None

Oral and Maxillofacial Surgery

Lecture	(code:	８０９１	1st year	:6units)
Practice	(code:	８０９２	1st～2nd year	:4units)
Lab	(code:	８０９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor : Hiroyuki Harada,
Junior Associate Professor : Yuji Kabasawa, Eriko Marukawa Part-time lecturer: Yutaka Maruoka
Contact person: Oral and Maxillofacial Surgery Hiroyuki Harada E-mail hiro-harada.osur@tmd.ac.jp

2. Classroom/Lab

Seminar room of the Department of Oral and Maxillofacial Surgery (Faculty Building of University Hospital of Dentistry, 9th floor). However, please confirm the location in advance with the instructor.

3. Course Purpose and Outline

Course Purpose and Outline is designed for clarifying the cause of the oral and maxillofacial diseases and developing a new treatment from clinical viewpoint.

4. Course Objective(s)

Course objective is to understand the cause and treatment of malformation, facial deformity, mucosal disease, and neoplasm arising in oral and maxillaofacial region.

5. Format

Small groups with maximum opportunity for discussion.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The program is designed for understanding the broad knowledge and basic skills which are important for diagnosis, treatment, prognosis and prevention of oral and maxillofacial diseases.

Available programs:

Lecture June. 23- July. 28, 2015 on every Tuesday . 9:00to12:00
Special Lecture As needed
Seminar As needed
Staff conference Every Thursday 18:00 to 20:00

Practice

Goals/Outline:
The program is designed for understanding the clinical, imaging and pathological features which are important for diagnosis of oral and maxillofacial diseases. And the program is designed for determining the optimal treatments considering cosmesis and functions and practicing them in both outpatient and inpatient clinics.

Available programs:

Conference for new patients Every Monday 17:00 to 18:00, Every Wednesday 17:00 to 18:00
Special clinic and conference for oral cancer Every Tuesday 13:30 to 16:00, Every Friday 11:00 to 15:00
Conference with Department of Diagnostic Radiology and Oncology Every other Friday 18:00 to 19:00
Conference for oral cancer Every Friday 18:00 to 20:00
Conference for facial deformities Second and third Friday of every month 15:00 to 16:00
Preoperative conference Every Thursday 17:00 to 18:00

Lab

Goals/Outline:
Participate in research in the following fields, and learn the basic methods and skills for experimentation.

Available programs:

1. Molecular biological research related to invasion and metastasis of oral cancer.
2. Research related to dysfunction and QOL following oral cancer surgery.
3. Research related to distraction osteogenesis.
4. Research related to mandibular reconstruction through tissue engineering.
5. Research related to cleft palate and cleft lip bone grafting.

7. Grading System

Evaluation is based on participation (attendance) in lectures, practices and labs and on acquisition of skills and knowledge, and it is added to an evaluation when there is a presentation at the academic meeting.

8. Prerequisite Reading

It is necessary to learn the basic knowledge, medical examination and technique of oral and maxillofacial surgery

9. Reference Materials

Andersson Lars: ORAL AND MAXILLOFACIAL SURGERY, BLACKWELL PUBLISHING 2010 (ISBN:9781405171199)
京都大学大学院医学研究科外科学講座「外科研修マニュアル」南江堂
野間康弘、瀬戸皖一「標準口腔外科学」医学書院

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Every Tuesday 16:00-17:00. Associate Profesor. Harada Hiroyuki , Dep of Oral and Maxillofacial Surgery.

13. Note(s) to students

None

Oral and Maxillofacial Radiology

Lecture	(code:	８１０１	1st year	:6units)
Practice	(code:	８１０２	1st～2nd year	:4units)
Lab	(code:	８１０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Tohru Kurabayashi　　Associate Professor: Hiroshi Watanabe
Junior Associate Professor: Naoto Ohbayashi, Norio Yoshino
Contact person: Tohru Kurabayashi　　E-mail　kura.orad@tmd.ac.jp

2. Classroom/Lab

Laboratories of Oral and Maxillofacial Radiology (Dental building, 12th floor)

3. Course Purpose and Outline

To obtain enough knowledge for safe and effective use of ionizing radiation in dentistry

4. Course Objective(s)

To understand the characteristics of advanced imaging modalities and how to interpret their images

5. Format

The format depends on the instructor who teaches the students.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Main objective is to provide students opportunity to study advanced imaging modalities including digital imaging, cone-beam CT, multi-detector row CT and MRI.

Available programs:

Lecture　June. 18- July. 23, 2015　on every Thursday, 16:00-17:00
Journal Club　Thursday, 17:00-18:00
Film Conference　Wednesday, 8:20- 8:50

Practice

Goals/Outline:
The goal of the practice is mainly to obtain the professional skills of interpreting both conventional and sectional images of dento-maxillo-facial region.

Available programs:

Clinical training (Observation):　Monday, 16:00-17:00

Lab

Goals/Outline:
The main objective is to learn how to plan clinical research concerning imaging diagnosis and analyze the data.

Available programs:

Students can participate in any research group in Oral and Maxillofacial Radiology.:Monday, 16:00-17:00

7. Grading System

The attitude and the presentation skill of the students in each program will be evaluated.

8. Prerequisite Reading

Perticipants should have enough knowledge of radiology of the undergraduate level.

9. Reference Materials

Oral Radiology 6th ed., Mosby/Elsevier

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

At any time, E-mail address: kura.orad@tmd.ac.jp

13. Note(s) to students

Lectures are mostly held in Japanese. Students who chose this couse are asked to send email to the above address before May 10th.

Anesthesiology and Clinical Physiology

Lecture	(code: 8 1 1 1	1st year	:6units)
Practice	(code: 8 1 1 2	1st～2nd year	:4units)
Lab	(code: 8 1 1 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor and Chair Haruhisa Fukayama E-mail fukayama.anph@tmd.ac.jp

2. Classroom/Lab

Learners must confirm the venues before attending the seminar, conferences and lectures, because the different places may be used

3. Course Purpose and Outline

Learners will have knowledge concerning systemic management of dental patients, they are local anesthesia, general anesthesia, sedation, safe management of the dental patients. Also what is called dental anesthesiology will be eondorsed. For these purposes basic life sciences such as physiology and biochemistry are focused in the field.

4. Course Objective(s)

Physical evaluations, such as diagnostic methods, laboratory examinations, medical interviews and their practical methods are the main points. From what are derived from the information, propaer tactics will be chosen for systemic management. Also emergency cases can be managed after the program.

5. Format

Learners will be able to attend the seminars, clinical conferences and special lectures available at any time.
Seminar attendants will present and discuss about their own research process. Clinical conference attendants will be trained in clinical settings in assigned days.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Learners will consider generally the basic knowledge of local anesthesia, general anesthesia, psycho-sedation, systemic management and pain control in dentistry, and establish the basements of specialists in anesthesiology and clinical physiology. Learners will acquire the pharmacological action and action mechanism through discussion, clinical settings and research works. The aims of this course were to clarify the neuro-physiological pain mechanisms and their modulation ways, and to develop the new pain control methods and new local anesthetic methods. The other aims are to investigate the pain relative intrinsic biologically active substance and to clarify the occurrence mechanism of refractory pain diseases using molecular biology methods, and finally to establish the new treatment methods.

Available programs:

Lecture Nov. 10- Dec. 22, 2015 Every Tuesday 9:00-12:00
Case Conference Every Monday through Thursday 11:30-12:00
Journal Club Every Thursday 17:00-18:00
Progress Meeting Every Thursday 18:00-19:00

Practice

Goals/Outline:
Learners will acquire the physiological and pharmacological basic knowledge and methods in dental clinical settings of local anesthesia, general anesthesia and psycho-sedations, and also learn pathology of pain diseases.

Available programs:

Presentation of research Every Wednesday and Thursday 16:00-16:30
Clinical practice assigned

Lab

Goals/Outline:
The aims of the course are to establish and develop the non-invasive percutaneous and per mucosal drug delivery, and also clarify the pain occurrence mechanism and develop their managements. The reaction to the pain of living body will be studied.

Available programs:

Learners are available to join the following research groups.
1) Research of mechanism in Diffuse Noxious Inhibitory Controls
2) Research in Drug delivery system
3) Research in relation between pain and autonomic nervous system
4) Research of occurrence mechanism of neuropathic pain.

7. Grading System

Learners are generally assessed in the base of their attitudes to the lecture, seminar, and discussion including their attendance. Research protocols and relationships of research conferences are also evaluated by repetitions of the related academic conferences.

8. Prerequisite Reading

Learners should have the knowledge of basic dentistry including skill because anesthesiology for dentistry will be presented. Any introductive textbook can be recommended regarding anesthesiology for dentistry.

9. Reference Materials

Principles and Practice of Anesthesiology, Secondo Ed, Longnecker et al Mosby

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Appoitment needed using fukayama.anph@tmd.ac.jp (usually after 5pm)

13. Note(s) to students

None

Orofacial Pain Management

Lecture	(code: 8121	1st year	:6units)
Practice	(code: 8122	1st～2nd year	:4units)
Lab	(code: 8123	2nd～3rd year	:8units)

1. Instructor(s)

Prof. Shimada Masahiko
Contact person: Prof. Shimada Masahiko E-mail mshimada.ofpm@tmd.ac.jp

2. Classroom/Lab

Confirm it to the charge contact person.

3. Course Purpose and Outline

The Course purpose is to study the basis of the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis and motor paralysis in the orofacial area.

4. Course Objective(s)

Main objective of orofacial pain management in the postgraduate course is to study on the basis of the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement and motor paralysis in the orofacial area, in particular, mechanism of pain, neuropathic pain, so on.

5. Format

It is basically assumed the few people system. The place for debating is installed as much as possible to improve the interrelation with the student.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Main objective of orofacial pain management in the postgraduate course is to lectures on the basis of the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis, abnormal movement and motor paralysis in the orofacial area, in particular, mechanism of pain, neuropathic pain, so on.

Available programs:

Lecture 14:00～16:00, every Monday from Oct.19 to Dec.21
Special Lecture A special lecture has been held on Friday 17:15～19:15 December.
Journal Club The fourth Wednesday every month, 18:00～19:00
Oriental oral medicine Seminar The fourth Wednesday every month, 18:00～19:00

Practice

Goals/Outline:
The purpose of practice is to study the basis of the diagnosis and treatment of the disease with a pain, abnormal sensation, sensory paralysis and motor paralysis in the orofacial area

Available programs:

Clinical Conference has been held the fourth Wednesday every month, 18:00～19:00
Clinical training has been performed on Monday, Tuesday , Thursday, Friday , 9:00～12:00

Lab

Goals/Outline:
The main goal is to plane the design of Experiment concerning pain and abnormal sensation.

Available programs:

Participation in the research group would be possible at any time.

7. Grading System

An integrated evaluation is done based on the participation situation to the lecture and research content.

8. Prerequisite Reading

Preparation for a class is to read the Orofacial Pain Textbooks and Papers

9. Reference Materials

Orofacila Pain From Basic Science to Clinical Management, 2th Edition, Barry, J. Sessle et al.
Quintessence Publishing Co, Inc

10. Important Course Requirements

Reading of Orofacial Pain Textbooks and Papers in advance is Important Course requirements

11. Availability in English

Available(on request)

12. Office Hour

Information: Masahiko Shimada, E-mail mshimada.ofpm@tmd.ac.jp

13. Note(s) to students

None

Pediatric Dentistry

Lecture	(code: ８１３１	1st year	:6units)
Practice	(code: ８１３２	1st～2nd year	:4units)
Lab	(code: ８１３３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: MIYASHIN Michiyo
Contact person: MIYASHIN Michiyo E-mail : miyashin.dohs@tmd.ac.jp

2. Classroom/Lab

Unfixed. The students are advised to make a contact with the instructor in advance.

3. Course Purpose and Outline

In this couse, students will search the oro-facial functions, being developed and acquiered from newborn period to childhood as well as growth and development of the surrounding tissues and organs in this region. Students will also investigate pathogenesis and pathophysiology of the diseases that disturb development and acquirement of these functions.

This course aims to develop theory and methodology not only for the developmental guidance of the oro-facial functions but also for diagnosis, prevention and treatment of related diseases and malfunctions.

4. Course Objective(s)

After completion of this course,the students will be able to;
1)explain the oro-facial functions, such as sucking, mastication, swallowing, and articulation,as well as growth and development of the surroundingtissues and organs in this region.
2)explain pathogenesis and pathophysiology of the diseases that disturb development and acquirement of these functions.
3)analyze the oro-facial functions and growth and development of children to develop theory and methodology for the developmental guidance.
4)analyze pathogenesis and pathophysiology of the diseases that disturb development and acquirement of these functions to develop new methods for the treatment and prevention of the diseases.

5. Format

Seminar style

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
This lecture will guide students to understand the oro-facial functions, such as sucking, mastication, swallowing, and articulation, being developed and acquiered from newborn period to childhood as well as growth and development of the surrounding tissues and organs in this region. Students are also taught pathogenesis and pathophysiology of the diseases that disturb development and acquirement of these functions. Students will study theory and methodology not only for the developmental guidance of the oro-facial functions but also for diagnosis, prevention and treatment of related diseases and malfunctions.

Available programs:

Lecture : Oct. 23- Feb. 19 Every Friday 17:00～18:00
Special lecture : At anytime
Seminar : Monday to Thursday 17:00～18:00
Paper reading : Friday 13:00～14:00

Practice

Goals/outline:
The comprehensive dental practice for child patients will guide student to understand the developmental processes of the oro-facial functions, and to study the outline of the method for diagnosis, prevention and treatment of the related diseases and malfunctions. The practice will also provide students to learn theory and method for the developmental guidance of these functions in the clinical viewpoints.

Available programs:

Clinical conference : Friday 18:00～18:30

Lab

Goals/outline:
The students will analyze the developmental processes of the oro-facial functions as well as the growth processes of the related organs by the morphological, physiological and biological aspects to develop the method for the developmental guidance of these functions. The students also analyze pathogenesis and pathophysiology of the diseases that disturb development and acquirement of these functions to develop new methods for the treatment and prevention of the diseases.

Available programs:
The students can join any research groups at any time.

7. Grading System

Be assessed by the attendance/activities in the class and the research planning of each student. Any research report or paper presentation in a meeting will also be used for the comprehensive assessment and grading.

8. Prerequisite Reading

The students need to read the text books prior to the lectures. The presentation file using in the lecture will be distributed in each lecture. Please join in the discussion actively on every lecture.

9. Reference Materials

Dean, JA, Avery, DR and Mcdonald, RE "Dentistry for the Children and Adolescent", Mosby Elsevier, 2011
Pinkham, JR "Pediatric Dentistry Infancy Through Adolescence 4th Ed.", Elsevier Saunders, 2005

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Please make contact by E-mail.
E-mail access to: miyashin.dohs@tmd.ac.jp

13. Note(s) to students

None

Orthodontic Science

Lecture	(code: 8141	1st year	:6units)
Practice	(code: 8142	1st～2nd year	:4units)
Lab	(code: 8143	2nd～3rd year	:8units)

1. Instructor(s)

Takashi Ono, Professor and Chairman

2. Classroom/Lab

Contact to the person in charge beforehand.

3. Course Purpose and Outline

Orthodontic Science is one of the dental sciences which propose to control teeth, periodontium, and craniofacial growth and development in equilibrium with the whole body, and also deals with the prevention and/or treatment of malocclusion and related disorders, by which the alteration of maxillofacial function with aging could be kept to the most suitable condition.

The purpose of this course is for a doctoral student to master basic and the clinical method for orthodontic reserch, and to be able to be accepted papers. Moreover, the purpose of this course is to educate orthodontists who have knowledge and clinical technique about basic and clinical orthodontic science.
1) To explain the unhealthy physiological condition of malocclusion and deepen the scientific basis for orthodontic treatment.
2) To understand the biological reaction and adaptation of occlusal tissues to mechanical stresses such as occlusal force or orthodontic force, and also the changes with aging.
3) To explain the art for controlling the morphologic and functional problems of occlusion in orthodontic treatment, from the view points of biomaterials and biomechanics.
4) To enlighten the social dentistry for the needs and demands of orthodontic treatment.

4. Course Objective(s)

1) To acquire suitable and sufficient learning and thinking ability about orthodontic study and reach the capability and knowledge to promote each subject of research logically
2) To acquire sufficient knowledge to apply for the certified doctor of Japan Orthodontic Society, and clinical experience by obtaining suitable and sufficient learning and experience about orthodontic treatment

5. Format

Generally in a small class.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Available programs:

Lecture Apr. 21- Feb. 23 every Tuesday, 9:30-12:00
Special Lecture as needed
Seminar as needed

Practice

Goals/Outline:
To understand the alteration of occlusal function and morphology, and to explain the pathological condition of malocclusion from the viewpoint of physiology, biomechanics, biology and sociology.

Available programs:

Training for clinical examination as needed
Clinical practice (see patients) 4.5 hour/week
Clinical study by observation (treatments, diagnoses) every Tuesday and Friday, 9:00-12:00
Clinical Conference as needed
Training for diagnosis and treatment planning (basic skill, typodont) as needed
Seminar for Sociology as needed
Department Seminar every Wednesday and Friday, 17:00-19:00

Lab

Goals/Outline:
To understand the procedure of biological reaction and adaptation of occlusal system to the orthodontic stimuli, including the influence of aging, and to provide the control of the surroundings of the occlusal system.

Available programs:

Progress meeting as needed
Research seminar as needed

7. Grading System

Students will be judged and evaluated comprehensively according to the participation in discussion, argument, exercise, research practice, presentaion and speech. In addition, students will be evaluated comprehensively based on the details of research, the grade of the involvement in the various researches or research meetings and the number of presentation in an academic society.

8. Prerequisite Reading

Prepare in advance when a reference book or paper is instructed.

9. Reference Materials

Contemporary Orthodontics 5th edition, Proffit WR, Elsevier Mosby, 2013, ISBN: 9780323083171
Other reference book and papers will be instructed each time.

10. Important Course Requirements

Please offer in advance when inevitably absent.

11. Availability in English

Available(on request)

12. Office Hour

Contact person: Takashi Ono, Orthodontic Science, Momday and Wednesday 16:00-17:00 E-mail t.ono.orts@tmd.ac.jp

13. Note(s) to students

The final evaluation will be held in the end of every year to acknowledge the promotion or graduation.

Cariology and Operative Dentistry

Lecture	(code: ８１５１	1st year	:6units)
Practice	(code: ８１５２	1st～2nd year	:4units)
Lab	(code: ８１５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Junji Tagami, Associate professor Masayuki Otsuki
Lecturer: Toru Nikaido, Masatoshi Nakajima
Assistant professor :Yasushi Shimada, Yuichi Kitasako, Takako Yoshikawa, Go Inoue, Keiichi Hosaka, Tomohiro Takagaki, Rena Takahashi
Contact person: Masayuki Otsuki E-mail otsuki.ope@tmd.ac.jp

2. Classroom/Lab

to be announced

3. Course Purpose and Outline

To learn about diagnosis, prevention and treatment of dental caries and other diseases of dental hard tissues and the related dental materials and devices and to learn research methods of these fields.

4. Course Objective(s)

To understand diseases of dental hard tissues.
To understand prevention and treatment of dental hard tissues
To understand materials and devices for prevention and treatment of dental hard tissues
To be able to perform the research for those fields

5. Format

Practice and Lab are organized in small group.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The goal of this course is to acquire the knowledge about the dental caries including diagnosis, prevention, treatment and restorative materials and to integrate it based on operative dentistry.

Available programs:

Lecture at 17:40-19:00 on Wednesday in April - December
Special Lecture at 15:00pm-17:00 on Wednesday in January to March
English will be used in all lectures
Seminar at 17:00pm on Monday - Friday

Practice

Goals/Outline:
The goal of this course is to understand basic and clinical research about carioloy and operative dentistry and to form a research project of own research.

Available programs:

group discussion at 17:00pm on Monday - Friday
practice of presentation Befor several weeks of presentation, at 17:00pm on Wednesday

Lab

Goals/Outline:
The goal of this course is to master the experimental technique to perform own project.

Available programs:

participation in each research project group

7. Grading System

Scored by attendance, report and/or examination

8. Prerequisite Reading

Related articles and textboox should be read before lecture.

9. Reference Materials

Fundamentals of Operative Dentistry, Summitt JB et.al.
Art & Science of Operative Dentistry, Roberson TM et. Al.

10. Important Course Requirements

The score is evaluated based on attendance of the lecture, examination, presentation and publication of reserch.

11. Availability in English

available

12. Office Hour

17:00- Monday - Friday

13. Note(s) to students

To take Lecture is required for participation in Practice and Lab.

Fixed Prosthodontics

Lecture	(code:	8161	1st year	:6units)
Practice	(code:	8162	1st～2nd year	:4units)
Lab	(code:	8163	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Hiroyuki Miura　　Associate Professor: Keiichi Yoshida
Lecturer: Daizo Okada ,Wataru Komada
Assistant Professor: Chiharu Shin, Shiho Otake, Satoshi Omori, Reina Nemoto
Adjunct instructor: Eiichi Bando, Keiichi Sasaki, Masanori Nakano
　Contact person: Daizo Okada　 E-mail d.okada.fpro@tmd.ac.jp

2. Classroom/Lab

Refer to contact person

3. Course Purpose and Outline

Based on up-to-date latest research, Students learn and discuss the crown restoration adapted to the stomatognatic function and thebiocompatible materials in this course.

4. Course Objective(s)

Acquisition of the crown restoration adapted to the stomatognatic function
Understanding of latest biomaterials in the crown restoration

5. Format

Small group instruction

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Integrated learning of matters related to recover and maintain proper eating functions.
Commentary from a biological standpoint on the methods for recovering from functional and cosmetic disturbances of oral and maxillofacial area caused by defect and loss of teeth

Available programs:

Lecture　 every Wednesday (17:30 ～19:00) (Oct.14th to Dec.16th)
Special Lecture　 at anytime
Seminar　 at anytime
Journal Club　 every Thursday (17:00 ～18:00)

Practice

Goals/Outline:
Learning of mandibular movements and reproducibility of mandibular movements on the articulator
Learning of mechanism of semi-adjustable articulator and its effect on occlusal surface configuration of prosthetics

Available programs:

training seminars for new recruits at anytime

Lab

Goals/Outline:
Learning of objective diagnosis method of oral functions
Learning of experimental methodology for measurements of mandibular movements, and masticatory efficiency and functional testing of occlusal functions (tooth contact, tooth displacement, occlusal force)

Available programs:

Participation in a research group at anytime

7. Grading System

The attitude toward the lecture, practical works, exercise and research training and the participation situations, such as announcements or presentations, are comprehensively evaluated. In addition, synthetic evaluation is performed based on the details of research or the level of involvement to the researches.

8. Prerequisite Reading

In the case of handouts were distributed beforehand, these documents read thoroughly

9. Reference Materials

Refer to the handouts distributed

10. Important Course Requirements

None

11. Availability in English

Available(on request)

12. Office Hour

Daizo Okada 17:00-18:00 every Tuesday (E-mail d.okada.fpro@tmd.ac.jp)

13. Note(s) to students

None

Pulp Biology and Endodontics

Lecture	(code: 8171	1st year	:6units)
Practice	(code: 8172	1st～2nd year	:4units)
Lab	(code: 8173	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Takashi Okiji
Associate Professor: Mitsuhiro Sunakawa
Junior Associate Professor: Atsushi Takeda, Hideharu Ikeda
Assistant Professor: Arata Ebihara, Nobuyuki Kawashima, Hiroyuki Matsumoto, Reiko Wadachi, Noriyuki Suzuki, Satoshi Watanabe, Jun Kawamura
Lecturer: Tomoo Anjo, Satomi Takahashi, Yousuke Hayashi

2. Classroom/Lab

The lectures are presented in 3rd Lecture Room on the 2nd floor of Building 7 (Faculty of Dentistry and Animal Research Center Building). The venues for the other programs will be announced during the lecture course.

3. Course Purpose and Outline

This course aims to provide students with current knowledge about (i) pathobiology of pulpal and perradicular diseases, (ii) pulp regeneration and (iii) advanced strategies for endodontic diagnosis and treatment, in order to improve students' clinical problem-solving ability.

4. Course Objective(s)

After completing this course, the student should be able to describe (i) pathobiological mechanisms involved in pulpal and periradicularl diseases, (ii) principles and current research status of dental pulp regeneration, and (iii) current diagnostic and treatment measures in endodontics.

5. Format

Sufficient question and discussion time is allocated for the student to actively engage in the above programs.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

The lectures deal with current knowledge on (i) immunological and pathophysiological mechanisms involved in the development of pulpal and periradicularl diseases, (ii) principles and current research status of dental pulp regeneration, and (iii) clinical topics in endodontics, such as diagnostic imaging, vital pulp therapy and application of lasers.

Available programs:

Lecture Every Friday from December to February 10:00～12:00
Special Lecture Thursday from December to February (details will be announced)
Journal Club Every Thursday 17:00～18:00

Practice

All students are asked to exercise endodontic problem-solving of various clinical cases, including diagnosis and management of dental pain, preservation of the tooth pulp, strategies to deal with the complex root canal system, and surgical endodontics.

Available programs:

Clinical Conference Every Thursday 18:00～19:00

Lab

Students can participate in research programs, such as laser application to endodontics and immunohistochemistry.

Available programs:

Participation in a research group as needed

7. Grading System

Grade-point evaluation (4, 3, 2, 1, 0) is made for each student at the end of the course, based on the efforts made by the student toward the lecture, practice and lab.

8. Prerequisite Reading

Students should confirm the basic knowledge prior to each class, refering to related papers and references shown below.

9. Reference Materials

1. Seltzer and Bender's Dental Pulp. ed. by Hargreaves KM, Goodis H & Tay FR, 2nd ed., Quintessence Publishing, 2012.
2. Pathways of the Pulp. ed. by Cohen S, Hargreaves KM, Keiser K, 10th ed., Mosby, 2010.
3. Essential Endodontology. ed. by Ørstavik D & Pitt Ford T, Blackwell-Munksgaard, 2nd ed., 2008.

10. Important Course Requirements

Lectures may be held as live TV lectures linked to foreign universities.

11. Availability in English

Available

12. Office Hour

Contact to Prof. Okiji (E-mail: t.okiji.endo@tmd.ac.jp)

13. Note(s) to students

All lectures are presented in English.

Removable Partial Prosthodontics

Lecture	(code:	８１８１	1st year	:6units)
Practice	(code:	８１８２	1st～2nd year	:4units)
Lab	(code:	８１８３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Noriyuki WAKABAYASHI (Professor), E-mail: wakabayashi.rpro@tmd.ac.jp

2. Classroom/Lab

Dental Building North, 11F
Removable Partial Prosthodontics Meeting Room
Verifying the lecture room is necessary according to the program executed.
http://www.tmd.ac.jp/pro/PostGrad/PostGrad.html

3. Course Purpose and Outline

The purpose of the Removable Partial Prosthodontics course is to provide advanced knowledge in specialty of Prosthodontics and related research. The postgraduate students who are enrolled concurrently in wide range of oral health sciences are welcomed to our class.

4. Course Objective(s)

The course objectives are to gain fundamental knowledge about the Prosthodontics research methodology and its updated trend that are benefit for individual research directions.

5. Format

Every candidate has to address his or her opinion freely to the others.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Aims/outline:
Professor and associate professors of Removable Partial Prosthodontics provides lectures on their specialty research areas in Prosthodontics. Following lecture titles outline the content of this special course; "Two points of research view for tooth loss", "Clinical evaluation of chewing ablity", "Load map to clinical research design", "Biomaterials research in Prosthodontics", "Introduction to stress analysis".
Goals/Objectives:
The program objectives are to provide our concept for Prosthodontics research and to equip students to critically analyze individual research directions.

Available programs:

Lecture　Removable Partial Prosthodontics
Lecturers　Noriyuki Wakabayashi, Kenji Fueki, Takeshi Ueno, and Ichiro Minami
Term　Every Monday: 5.Oct - 16.Nov. 2015. (6 lectures)
Time　17:00-19:00

Special Lecture on "Prosthodontics for disabled elderly"
Lecturer　Kazuhiro Hori
Term　13.Nov. 2015
Time　17:00-18:30

Special Lecture on "Re-evaluation of jawbone reconstruction as a tissue engineering technique"
Lecturer　Hideharu Hibi
Term　12.Feb. 2016
Time　17:00-18:30

Lecture Room for all above
Prosthodontics Demonstration Room, Dental School Building (Building 7) 3F.
Yushima Campus (See our website for definitive schedule and place a few weeks before course)

Practice

Practices on clinical diagnosis, decision-making, and prosthodontic treatment procedures.

Available programs:

A yearly removable prosthodontics practice course is provided every month for junior post gradute students. Verifying the schedule at the website below is necessary according to the program executed.
http://www.tmd.ac.jp/pro/education/ContinuingEd/ContinuingEd.html

Lab

Practice on research methods, presentation, and scientific writing by hands-on instructions.

Available programs:

Advanced course of prosthodontics research for postgradute students, six sessions per year. Verifying the schedule at the website below is necessary according to the program executed. http://www.tmd.ac.jp/pro/PostGrad/PostGrad.html

7. Grading System

Comprehensive assessment is planned based on the presence, practice and labo-work and the completion of the theme.

8. Prerequisite Reading

Visit our website for latest published articles:
http://www.tmd.ac.jp/pro/Research/Research.html

9. Reference Materials

Visit our website for latest published articles:
http://www.tmd.ac.jp/pro/Research/Research.html

10. Important Course Requirements

See our website for definitive lecture title, schedule and place a few weeks before each lecture.

11. Availability in English

Available

12. Office Hour

Anytime for Professors (Wakabayashi, Fueki, Ueno, and Minami), only on lecture site for visiting Professors (Hori and Hibi).

13. Note(s) to students

Notice to our website for change of schedule and lecture hall.
http://www.tmd.ac.jp/pro/PostGrad/PostGrad.html

Oral Implantology and Regenerative Dental Medicine

Lecture	(code: ８１９１	1st year	:6units)
Practice	(code: ８１９２	1st～2nd year	:4units)
Lab	(code: ８１９３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Shohei Kasugai　　TEL 03-5803-5934　E-mail kas.mfc@tmd.ac.jp

2. Classroom/Lab

1st Lecture Room (Building 1 West, 7F), Dental Implant Clinic (Dental Hospital, 7th floor), Center for Experimental Animals

3. Course Purpose and Outline

Goals/outline:
Prosthetic treatments with dental implants (dental implant treatment) for edentulous patients have been effective and predictable. The students will be able to learn the characteristics of dental implant treatments and dental implant materials and renew knowledge concerning all steps in dental implant treatment including clinical examinations, treatment planning, implant surgery, prosthodontics procedures and maintenance.
In dental implant treatment bone augmentation and soft tissue management are frequently required. In this course, regenerative treatments, which relate to dental implant treatment, will be presented and discussed. Especially, future possibility of regenerative medicine in dental field will be discussed.
The purposes of this course are to understand current dental implant treatment and the related regenerative dental medicine and to predict the future directions of researches in this field.

4. Course Objective(s)

The objectives of this program is to be possible to explain the scientific background of merit and demerit of modern implant treatment and the detail of the related augmentation techniques of soft and hard tissues.

5. Format

Lectures by the instructors and presentations by the participants regarding the given subjects

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lectures

The purpose of this program to understand the current dental implant treatment, clinical applications and resrearches of the related tissue regenerations.

Available programs:

Lecture(Latter Semester):Oct. 22- Feb. 25　Thursday　18:30 - 20:30
Seminar and Journal Club　①Tuesday 7:30 - 8:30,　Monday 18:00 -19:00　②Friday (2nd, 4th) 8:00 - 9:00

Practice

Goals/Outline:
The purpose of this program is to understand the points in all steps of dental implant treatment: Clinical examinations, treatment planning, surgery, prosthetic procedures and maintenance. Several clinical cases will presented and treatment planning of these cases will be discussed.

Available programs:

Clinical Conferences　Monday - Thursday　17:30-18:30,　Friday　18:00 -19:00

Lab

Goals/Outline:
The purposes of this course are to clarify current clinical problems in dental implant treatment and to learn basic concept of planning researches to solve these problems. The researches, which are currently conducted by students in Department of Oral Implantology and Regenerative Dental Medicine, will be presented. The participants of this course will have chances to see animal experiments concerning dental implants and the related regenerative medicine.

Available programs:

to be announced

7. Grading System

based on attendance and attitude. Furthermore, publications in scientific journals and presentations in scientific meetings will be considered.

8. Prerequisite Reading

Knowledges in cell biology, biological material science, oral anatomy, phisiology, pharmacology, radiology, internal medicine, oral surgery, periodontology, prosthodontics are required for this program. Read the textbooks of these subjects. Please be able to make a presentation of your related or intersted studies published in international journals briefly (1～2min).

9. Reference Materials

・Clinical periodontology and implant dentistry.Jan Lindhe/Willey-Blackwell
・Dental Implant Prosthetics.Carl E.misch/Publisher:Elsevier MOSBY

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Department of Oral Implantology and regenerative dental medicine
Shohei Kasugai
Phone 03-5803-5934
Email:kas.mfc@tmd.ac.jp

13. Note(s) to students

Lecture and journal club are in English. Students having interests in this field are welcome. Students are encouraged to participate in discussions actively.

Plastic and Reconstructive Surgery

Lecture	(code:	７０１１	1st year	:6units)
Practice	(code:	７０１２	1st～2nd year	:4units)
Lab	(code:	７０１３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Mutsumi Okazaki Lecturer Hikoki Moki
Contact person: Mutsumi Okazaki, Professor E-mail okazaki-plas@tmd.ac.jp

2. Classroom/Lab

Confirm to the instructor in charge before lecture.

3. Course Purpose and Outline

In the plastic surgery, a thinking process to choose surgical procedure is more important than surgery itself. In this course, we lecture on the preoperative treatment, process to choose operative procedures, and postoperative treatment.

4. Course Objective(s)

Understanding process to choose surgical procedures and practicing them

5. Format

Small-group session is adopted in order for intense discussion.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals:
To recognize meaning and necessity of plastic surgery, and to understand objective disorders and treatments for them.
Outline:
Explaining concepts of 4 major objectives of plastic surgery, 1: Conjenital anomaly, 2: Traumatic deformity, 3: Deformity after tumor resection and 4: Aesthetic surgery. Furthermore, explaining basic techniques (excision & suture, skin graft, flap transfer and other tissue transplantation) and advanced techniques (microsurgery and craniofacial surgery) as therapeutic modality for objective disorders.

Available programs:

Lecture Every Wedensday 8:00～9:30
Research meeting Tuesday 20:00～20:30
Journal Club Tuesday 20:30～21:00

Practice

Goals:
To decide a suitable treatment for each disorder, to handle surgical instruments and sutures correctly and to explain selected therapeutic procedures logically and perform them.
Outline:
Diciding a therapeutic strategy for each case in preoperative conference, and participating in operations.

Available programs:

Seminar Every Tuesday 18:30～20:00Preoperative case conference Every Tuesday 18:00～18:30
Meeting about the operative procedures Every Tuesday 18:00～18:30
Ward round Monday to Friday 9:00～12:30、17:00～18:00
Operation Monday to Friday 9:00～17:00

Lab

Goals:
Revealing disease mechanism of objective disorders of plastic surgery, and developing new therapeutic approaches based on experimental results.

Outline:
Acquiring techniques for experimentation and analyzing obtained experimental data.

Participation in a research group As needed
Experimentation of plastic surgery
Contents
1) Microsurgery, vascularized free tissue transfer, neurorrhaphy
2) Culture of keratinocyte, fibroblast, and melanocyte
3) Various immunostaining, insitu hybridization, mRNA expression analysis
4) Evaluation of blood supply to various flaps using indocyanine green.
5) Application of the negative pressure therapy to peripheral nerve regeneration and fat graft
6) Analysis of volume and blood supply to the flaps using nano-spectrum CT.

Available programs:

Meeting about the operative procedures Every Tuesday 18:00～18:30
Research meeting Tuesday 20:00～20:30

7. Grading System

Grade is given based on attitude to lectures(70%) and publication of research outcome(30%).

8. Prerequisite Reading

Lecture：Participating after reading relevant part of the reference book.
Practice: Before practice, think anout optimal operative procedures by yourself.

9. Reference Materials

1) Grabb & Smith Grabb and Smith's Plastic Surgery (7 HAR/PSC)
Thorne, Charles H., M.D. (EDT)/ Chung, Kevin C., M.D. (EDT)/ Gosain, A
2) Plastic Surgery, 3rd ed., in 6 vols. With Expert Consult Premium Edition P.C.Neligan(ed.)
3) Essentials of Plastic Surgery, Second Edition Jeffrey E. Janis ed.

10. Important Course Requirements

Lecture and practice can become meaningful by prior and post self-learning. Japanese medical license is necessary to participate in an operation or clinical study.

11. Availability in English

Available

12. Office Hour

Monday to Friday 9:00-17:00
Contact person: Mutsumi Okazaki, Professor E-mail okazaki-plas@tmd.ac.jp

13. Note(s) to students

It is advisable that journal club and research conference are held within 5 persons, although the number is not strictly limited.

Head and Neck Surgery

Lecture	(code:	７０２１	1st year	:6units)
Practice	(code:	７０２２	1st～2nd year	:4units)
Lab	(code:	７０２３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Takahiro Asakage
Junior associate Professor: Takuro Sumi
Contact person: Takuro Sumi
Department of Head and Neck Surgery
E-mail: sumi.oto@tmd.ac.jp

2. Classroom/Lab

Depend on the programme.

3. Course Purpose and Outline

Develop exellent human resources of head and neck surgeon.
For the purpose, It is needed to understand anatomy, pathology, the way of diagnosis, and treatment strategy.
In addition, resarch about new clinical technique or clinical anatomy.

4. Course Objective(s)

① Understand clinical feature of head and neck tumor.
② Acquire diagnosis skills of head and neck tumor.
③ Be able to select the suitable treatment method.
④ Reserch and development for new knowledge about head and neck anatomy or treatment

5. Format

The format comprises a small number of students.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
We mainly deal with head and neck tumours. Lectures are focused on the clinical characteristics and pathogenesis of these head and neck tumours. Furthermore, various treatments strategies for these tumours are shown.

Available programs:

Lecture: as needed
Special Lecture: as needed
Seminar: monthly, as needed
Journal Club: every Tuesday, 8:20-9:00

Practice

Goals/Outline:
There are three goals:
· First, to master the diagnostic techniques for head and neck tumours, by means of physical and endoscopic examinations.
· Second, to understand the findings of imaging utilities, such as X-ray, CT, MRI and US.
· Third, to properly select the appropriate treatments for head and neck tumours in consideration of function and appearance.

Available programs:

Conferences:
Outpatients with head and neck tumours: every Thursday 17:30-18:30
Inpatients with head and neck tumours (joint with plastic surgeon and neurosurgeon, as needed): every Tuesday 18:30-20:00
The patients who receive radiation therapy (joint with radiologists): biweekly Thursday 18:00-18:30
Ward rounds: every Tuesday 9:00-11:00

Lab

Goals/Outline:
(1) Anatomy of the skull base.
(2) Development of new surgical techniques in cancer treatment.
(3) Clinical application of new devices in endoscopic examination.
(4) Surgical treatment of paediatric head and neck tumours.

Available programs:

Participation in each study group: as needed

7. Grading System

The evaluation of results is based on contents of reports, presentations at conference and original articles.

8. Prerequisite Reading

The knowledge about general otorhinolaryngology and surgical oncology are required.

9. Reference Materials

not available.

10. Important Course Requirements

nothing in particular

11. Availability in English

none

12. Office Hour

email to: sumi.oto@tmd.ac.jp

13. Note(s) to students

Radiation Therapeutics and Oncology

Lecture	(code:	７０３１	1st year	:6units)
Practice	(code:	７０３２	1st～2nd year	:4units)
Lab	(code:	７０３３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Ryoichi Yoshimura, MD E-mail ysmrmrad@tmd.ac.jp

2. Classroom/Lab

Check for charge instructors beforehand, because it's different depending on programs.

3. Course Purpose and Outline

To understand the influence of radiation on the body or tumor and the optimal radiation therapy.

4. Course Objective(s)

① Explain about external beam radiatiotherapy, brachytherapy, and radiopharmaceutical therapy
② Explain about the multimodal therapy including raditation therapy.
③ Propose the optimal raditation therapy plan according to each malignant tumor.

5. Format

Small number system is employed.
A chance of discussion is held aggressively.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline
Postgraduate courses are made to study clinical radiation medicine (radiation biology, radiation physics, and radiation oncology) to become specialist in oncology

Available programs:

Morning conference (Mon.～Fri. 8:30～9:00)
Radiation therapy plannning conference (Thu. 17:00～)
Radiology conference and journal club (Wed. 7:50～8:30)

Practice

Goals/Outline:
Students of our section are expected to obtain a doctorate degree by presenting thesis

Available programs:

Clinical conference in the area of radiation oncology

Lab

Goals/Outline:
Postgraduate courses are made to do retrospective study analyzing the effect of radiation therapy and prognostic factors, and to do planning of the prospective study based on the result of the retrospective study.

Available programs:

Particepation in a research group

7. Grading System

Estimated overall based on the participation situation to the lectures and the practices and the study contents.

8. Prerequisite Reading

Understand the radiation biology and physics.

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Ryoichi Yoshimura E-mail ysmrmrad@tmd.ac.jp

13. Note(s) to students

No number limitation.

Maxillofacial Anatomy

Lecture	(code: 8211	1st year	:6units)
Practice	(code: 8212	1st～2nd year	:4units)
Lab	(code: 8213	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Shunichi Shibata
Reserch Associate: Shun-ichi Shikano, Tamaki Tamaki Part-time Lecturer: Rei Sato
Contact person: Shunichi Shibata E-mail sshibata.mfa@tmd.ac.jp

2. Classroom/Lab

Maxillofacial Anatomy (6th floor, in MD tower)

3. Course Purpose and Outline

In order to take ability of assess biological phenomena from the viewpoints of morphology, we teach various structures in maxillofacial regions from the standpoints of gross anatomy, histology, and molecular biology. In addition,we teach methodlogy of organ/tissue culture, light and electron microscopy, and molecular biology.

4. Course Objective(s)

1) To explain the structural features and developmental process of maxilla and mandible. 2) To explain structural features and developmental process of teeth. 3) To explain the strucrure and developmental process of temporomandibular joints including articular disc and condylar caertilage. 4) To understand the process of making samples of light and electron microscopy. 5) To understand the methods of organ culture of tooth germ, bone and caretilage. 6) To explain the principles of immunohistochemistry and in situ hybridization.

5. Format

Depended on programs and lecturers, make sure it before taking a course.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To obtain the ability of appreciating various biological reactions morphologically, lecturers explain the function of various oral organs from the viewpoints of morphology. Further, lecturers explain their structural features using light and electron microscopy.

Available programs:

Lecture Oct. 14- Dec. 16 Wednesday 13:00-15:00
Seminar (1) Thursday 9:30-11:00 or 10:30-12:00

Practice

Goals/Outline:
Learn how to make samples for histological observations, execute practical procedures, and observe samples practically. Next, investigate references related to findings obtained and make a discussion, then present their data.

Available programs:

Seminar (2) Thursday 13:00-14:30

Lab

Goals/Outline:
Plan experimental system to investigate development, growth, and regeneration of oral tissues (tooth germ, periodontal tissues, jaw bone etc.), the execute it. To evaluate results, various techniques including making histological sections, staining, and taking pictures should be mastered.

Available programs:

Seminar (3) First Tuesday 9:00-10:30

7. Grading System

Evaluate is based on attendance for lecture and practice, and contents of studies.

8. Prerequisite Reading

Confirm contents of schedule which is ditributed before lectures and check structures features of corresponding organ/tissue by leaning textbooks/reference books.

9. Reference Materials

1)Wakita M et al. ed "Oral Histology and Embryology"(ISHIYAKU PULISHERS, inc) 2)Wakita M et al. ed "Oral Anatomy"(ISHIYAKU PULISHERS, inc) 3)) Sperber GH著 Craniofacial Embryogenetics and Development 2nd ed. People's medical publishing house - USA

10. Important Course Requirements

none

11. Availability in English

none

12. Office Hour

Maxillofacial Anatomy Shunichi Shibata Mondy-Friday 9:00-12:00 E-mail sshibata.mfa@tmd.ac.jp

13. Note(s) to students

Correspond to contact person before you take a course.

Cognitive Neurobiology

Lecture	(code: ８２２１	1st year	:6units)
Practice	(code: ８２２２	1st～2nd year	:4units)
Lab	(code: ８２２３	2nd～3rd year	:8units)

1. Instructor(s)

Masato Taira Professor E-mail masato.cnb@tmd.ac.jp
Hisayuki Ojima, Junior Associate Professor E-mail yojima.cnb@tmd.ac.jp
Narumi Katsuyama* Assistant Professor E-mail katz.cnb@tmd.ac.jp
*: Contact person

2. Classroom/Lab

Please contact the instructor (*) in advance.

3. Course Purpose and Outline

To understand complex brain functions, both basic knowledge in the textbooks and advanced knowledge associated with specific research topics are important. Lectures and practice are designed to help students understand how higher brain functions, such as motor, visual, and auditory functions, are represented in neuronal activities in the cerebral cortex.

4. Course Objective(s)

The aim of this course is to understand the basic knowledge and concepts for cortical mechanisms underlying higher brain functions through the lectures and practices.

5. Format

In a small group.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

1. Lecture: the basic knowledge of higher brain functions based on researches going in the laboratory will be given in lectures.
2. Special lecture: frontier of researches on higher brain functions will be presented by invited speakers.

Available programs:

Lecture: Nov. 13- Jan. 15, Friday, 17:30 - 19:00
Special Lecture: 4 lectures in the 2nd semester
Journal Club: every Monday, 18:00 - 19:30

Practice

Learn about basic knowledge and practice in functional MRI, psychophysical experiments, and handling and neuromal recording from animals.

Available programs:

There are several on-going research programs. Applicant will choose one/some in consultation with instructors.

Lab

Students can attend to one of the following projects.

On-going research themes include (1) motor control by cerebral cortex, (2) depth perception of human and animals, (3) cortical representation of body image, and (4) neural processing of natural sounds, by using psychophysical and fMRI techniques with humans, and electrophysiological and behavioral experiments with non-human primates and rodents.

7. Grading System

Evaluation is made based on the attendance rate, the contents of discussion, and reports submitted. When students are involved in research practice, presentation in meetings and symposia will also be evaluated.

8. Prerequisite Reading

Reading textbooks for neuroscience in advance is desirable (ex. Physiology of Behavior, 11 th Ed. by N. R. Carlson, Pearson Education, Inc, 2013).

9. Reference Materials

Lecture-related handouts and monographs will be distributed in the lectures and practice.

10. Important Course Requirements

none

11. Availability in English

none

12. Office Hour

Contact person; Katsuyama Narumi, Ph.D., E-mail katz.cnb@tmd.ac.jp

13. Note(s) to students

Request to pick up your interests in higher brain function as a topic in the lecture is welcome.

Molecular Craniofacial Embryology

Lecture	(code:	8 2 3 1	1st year	:6units)
Practice	(code:	8 2 3 2	1st～2nd year	:4units)
Lab	(code:	8 2 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor Sachiko Iseki, Associate professor: Masaaki Ikeda, Assitant professor: Masaki takechi
Part—time lecturers: Shigeru Okuhara, Shumpei Yamada, Hirofumi Doi
Contact person: Sachiko Iseki E-mail: s.iseki.emb@tmd.ac.jp

2. Classroom/Lab

Venue depends on each program, students are requested to contact the instructors for each program.

3. Course Purpose and Outline

Understanding of basic molecular mechnisms of craniofacial development and tissue regeneration

4. Course Objective(s)

Achievement of understanding in methods and strategy to study molecular craniofacial embryoology and tissue regeneration

5. Format

Lectures and practices are held to a group of small number of students. Since laboratory works are carried out individually, it is advised to contact each instructor about the detail.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outlines: To provide students with understanding the basics of molecular mechanisms of craniofacial morphogenesis, including craniofacial malformations associated with gene mutations.

Available programs:

Lecture Thursday between May.7 and July.23
Special Lecture 2 times per year
Journal Club TBA. Please contact the instructor

Practice

Goals/Outlines: Instructors and lab members present “Research Progress” including basic methods of experimental developmental biology and recent genetic engineering techniques to study molecular mechanisms of craniofacial morphogenesis and the regeneration as well as craniofacial malformations associated with gene mutations.

Available programs:

Research Progress TBA. Please contact the instructor

Lab

Goals/Outlines: Laboratory works are carried out to understand molecular mechanisms of craniofacial morphogenesis and the regeneration by using basic and advanced methods of histology, molecular biology and recent genetic engineering techniques. Our current focuses are: midface development, skull bone development and regeneration, tooth root formation.

Available programs:

Participation in a research group

7. Grading System

Evaluation is made based on the attendance to the lectures and on the research reports and/or presentation during the course.

8. Prerequisite Reading

Contact the course organizer

9. Reference Materials

1. Cranofacial Embryogenetics and Development by Geoffrey H. Sperber People's Medical Publishing House USA, Ltd. 2. Developmental Biology Scott F. Gilbert Sinaue 3. Principles of Development by LewisWolpert & Cheryll Tickle Oxford University Press

10. Important Course Requirements

Attending the lectures, introducing papers and research presentation

11. Availability in English

available

12. Office Hour

Contact: Sachiko Iseki s.iseki.emb@tmd.ac.jp

13. Note(s) to students

None

Cellular Physiological Chemistry

Lecture	(code:	８２４１	1st year	:6units)
Practice	(code:	８２４２	1st～2nd year	:4units)
Lab	(code:	８２４３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Ken-ichi Nakahama
Part-time Lecturer: Hiroshi Fujita, Yasuki Ishizaki, Masao Saito
Contact person: Ken-ichi Nakahama　E-mail: nakacell@tmd.ac.jp

2. Classroom/Lab

Venue depends on each program, students are requested to contact the instructors for each program.

3. Course Purpose and Outline

Lecture for the understanding of pathological and physiological conditions by cellular and molecular methods.

4. Course Objective(s)

Understanding of pathological and physiological conditions by cellular and molecular methods.

5. Format

Lectures and practices are held to a group of small number of students. Since laboratory works are carried out individually, it is advised to contact each instructor about the detail.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Available programs:

Course Lecture:　Sep. 15- Dec. 15, Friday　10:00～12:00
Special Lecture: TBA Please contact the instructor
Journal Club: Every Tuesday 9:30～10:00
Group Meeting: Every Tuesday 17:00～18:00

Practice

Goals: To understand how to investigate the mechanism of various diseases onset and development.
Outlines: The experimental techniques will be retrieve the goal mentioned above.

Available programs:

Presentation of Research, Every Tuesday 17:00～18:00

Lab

Goals: To equip the science sense
Outlines: After studying isolation and culture procedure of the cell from a living body, the pathogenic mechanism of various diseases onset and the target of the drugs are analyzed using these cultured cells.　Through the reading the journals, planning of an experimental design, method and carrying out research training by themselves are studied and mastering to make an experiment note and an English paper.

Available programs:

Participation in a research group

7. Grading System

Evaluation is made based on the attendance to the lectures and on the research reports and/or presentation during the course. Furthermore, experimental problem-solving skills are evaluated in Lab meeting or the presentation in scientific society

8. Prerequisite Reading

None

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Wed. Thu. 17:00 - 19:00, Please send E-mail to K. Nakahama beforehand (nakacell@tmd.ac.jp)

13. Note(s) to students

None

Metals

Lecture	(code:	８２５１	1st year	:6units)
Practice	(code:	８２５２	1st～2nd year	:4units)
Lab	(code:	８２５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Takao Hanawa Associate Professor Yusuke Tsutsumi Assistant professor Hisashi Doi; Maki Ashida
Part-time lecturer Takayuki Yoneyama
Contact person: Takao Hanawa TEL: 5280-8006 E-mail: hanawa.met@tmd.ac.jp

2. Classroom/Lab

Conference room 1 (3F), Institute of Biomaterials and Bioengineering

3. Course Purpose and Outline

Basic science and engineering of metallic biomaterials used in medicine and denstistry is learned. and these knowledge is applied to the research and development of new and novel metal-base biometerials.

4. Course Objective(s)

In order to understand metallic biomaterials further, coarse considering problems of metallic biomaterials such as ion dissolution of metals, fatigue, corrosion-fatigue, wear and so on, will be conducted if necessary. Biocompatibility of metals is also discussed with the recent literatures.

5. Format

All courses are carried out in a small group with discussion according to PBL method.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Metallic biomaterials are currently used for re-constitution of bio-functions in tissues and organs in the human body because of their high strength and fracture toughness. Over 80% implants consist of metals and its importance is increasing in medicine. We provide the basic knowledge of metals such as mechanical properties, corrosion resistance, and bio-safety in the lectures.

Available programs:

Lecture Every Monday from 14:00 to 17:00 (May 11 ～ Jun 15: No lecture on May 18)

Practice

Goals/Outline:
In order to understand metallic biomaterials further, coarse considering problems of metallic biomaterials such as ion dissolution of metals, fatigue, corrosion-fatigue, wear and so on, will be conducted if necessary. Biocompatibility of metals is also discussed with the recent literatures.

Available programs:

Semminar Every Monday from 18:00 to 19:00

Lab

Goals/Outline:
In order to study mechanical properties of metallic biomaterials, tensile, hardness, fatigue and friction tests will be carried out. The chemical properties will be also examined by ion dissolution and corrosion tests.

Available programs:

To be announced if necessary

7. Grading System

Grade point is evaluated from the report in the lecture, practice and lab and their attendance and presentaion in academic meetings (80%) and publication in scientific journals according to the following paroportion (20%):

8. Prerequisite Reading

Basic of Chemistry and Physics in high school level should be learned.

9. Reference Materials

Materials Science and Engineering An Introduction, Williams D Callister, Jr., Seventh Edition, John Wiley and Sons, 2007.
Biomaterials ScienceAn Introduction to Mterials in Medicine, BD Ratner, AS Hoffman, FJ Schoen, JE Lemons, Elsevier, 2013.

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

After reservation by e-mail.

13. Note(s) to students

Inquiry and questions on the metallic biomaterials are welcomed at all hours.
(hanawa.met@tmd.ac.jp, tsutsumi.met@tmd.ac.jp, doi.met@tmd.ac.jp)

Biodesign

Lecture	(code:	8261	1st year	:6units)
Practice	(code:	8262	1st～2nd year	:4units)
Lab	(code:	8263	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kazuo TAKAKUDA Assistant Professor: Wei WANG
Inquiry: Kazuo TAKAKUDA E-mail: takakuda.mech@tmd.ac.jp

2. Classroom/Lab

Shifts with contents, inquiry needed before attending.

3. Course Purpose and Outline

The class is for the understanding of fundamental concepts of mechanics, and introduction to the advanced studies including the biomechanics of living tissues, cells, and mechanical interaction with artificial materials. Some applications to the basics design of medical devices with mechanical functions are also discussed.

4. Course Objective(s)

Have the knowledge on fundamental concept of mechanics, on the basic equations of mechanics, and on the various strength characteristics of materials. Obtain the basic skill to evaluate the mechanical properties of tissues. Understand the principles to design the mechanical devices with efficacy and safety.

5. Format

Lectures and discussion in a small group.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
In the first year, through special lectures the basic knowledge of biomechanics will be introduced as well as its experimental methods. Students would learn how to analysis mechanical problems in living body. In the second year, through routine seminars students would keep up with the most recent status of related study areas.

Available programs:

Lecture on biomaterial mechanics: on every Thursday from 11 Jun to 16 Jul, 9:30 to 11:30.
Journal Club on biomechanical engineering: on every Wednesday of first and second semester, from 11:00 to 12:00.

Practice

Goals/Outline:
Students would learn and practice the mathematical operations in mechanical analysis of living tissues and biomaterials as well as the computer simulation techniques.

Available programs:

Practice of methods in biomaterial mechanics research: on every Thursday from 11 Jun to 16 Jul, 11:30 to 12:30.

Lab

Goals/Outline:
Students would learn and practice mechanical characterization of living tissues and biomaterials.

Available programs:

Biomechanical experiments: on every Monday of first semester, 11:00 to 12:00.

7. Grading System

Comprehensive assessment based on activity in the class (lecture, practice, and lab works) and achievements in respective investigations (presentations at conferences, and preparations of papers). The weights for these performances are; 80% for the activity in the class and 20% for the achievements in respective investigations.

8. Prerequisite Reading

Elementary knowledge on mathematics (partial differential equations and vector analysis) and classical physics (Newtonian dynamics) are necessary. Any textbook will helpful for carrying out a review.

9. Reference Materials

1. Fung, YC. Biomechanics. Springer.
2. Fung, YC. Foundation of Solid Mechanics. Prentice-Hall.

10. Important Course Requirements

Lectures and discussion in a small group.

11. Availability in English

None

12. Office Hour

Contact Prof Kazuo TAKAKUDA via E-mail, takakuda.mech@tmd.ac.jp. Meeting will be arranged quickly.

13. Note(s) to students

Limit on attenders: 10 persons for lectures and 5 persons for practices and experiments.

Maxillofacial Surgery

Lecture	(code:	8271	1st year	:6units)
Practice	(code:	8272	1st～2nd year	:4units)
Lab	(code:	8273	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kiyoshi Harada, Junior Associate Professor: Satoshi Yamaguchi, Narikazu Uzawa
Assistant Professor: Yutaka Sato, Noriyuki Yoshitake, Yasuyuki Michi, Kazuto Kurohara, Kouichi Nakakuki, Yoshio Ohyama
Contact person: Kiyoshi Harada TEL 5803-5498 E-mail haradak.mfs@tmd.ac.jp

2. Classroom/Lab

Each lecture is given in the different venue. Please ask the instructor and confirm the location of the venue.
1) Ward rounds: 8F Ward in Dental Hospital
2) Preoperative Conference: 9F Conference Room
3) CLP Clinic: 6F
4) FD Conference, Tumor Clinic: 6F
5) Seminar for Graduate students, Special lecture, Journal Club: at any time.

3. Course Purpose and Outline

・To understand the pathological condition and etiology of the disease occurred in the oral and maxillofacial regions.
・To experience the basic skills and knowledges about prevention, diagnosis, and treatment for these diseases.
・To train self-problem solving skills.

4. Course Objective(s)

・To explain the etiology and condition about diseases occurred in the oral and maxillofacial regions
・To explain the diagnosis, treatment, and prevention for these diseases
・To select the most suitable treatment strategies for each cases
・To establish the study plan and interpret the data appropriately.
・To explain the preparation and technique of the presentation and article writing.

5. Format

In principle, small group system is applied. And independency of the participants is respected.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
This lecture focused on diagnosis, treatment and prevention of congenital and acquired disease in the oral and maxillofacial region. In addition, you can study about recent diagnosis and treatment strategies of this field.

Available programs:

Course Lecture Apr. 14- Jun. 9, Tuesday 8:30～12:00
Special Lecture July, 2015
Seminar for graduate students every 3 or 4 months
Journal Club Friday 17:30～18:30

Practice

Goals/Outline:
Goals of this practice are to understand the etiology, diagnosis, choice of examination, laboratory data, and choice of optimum treatment for the diseases in the oral and maxillofacial region including Cleft Lip and palate, Facial Deformity and Oral and Maxillofacial tumor, and so on. Moreover, you can increase the knowledge about surgery using biomaterials and surgical reconstruction with anastomosis technique.

Available programs:

Conference for new patients　Tuesday & Thursday 16:30～17:30
Ward rounds　Friday 13:30~15:00
Preoperative Conference　Friday 15:00~16:00
Facial Deformity Clinic・Conference　Every other week Monday 13:00～15:00・Friday 15:00~16:00
Cleft Lip & Palate Clinic・Conference　Wednesday 13:00~16:00・The third week Friday 15:00～16:00
Tumor Clinic・Conference　Monday　13:00～16:00　Friday 10:00~12:00・16:30～17:00

Lab

Goals/Outline:
Goals of these Labs are to　learn the methods for　study planning, study performing, evaluation methods, conference presentation and thesis writing.

Available programs:

1. Clinical study of the Facial deformity and CLP
2. Basic study of the bone regeneration
3. Basic and clinical study of the TMJ disorders.
4. Basic and clinical study of the oral tumors
5. Genetic diagnosis and treatment of the oral cancers

7. Grading System

General evaluation is based on the attendance situation for the above-mentioned lectures, practices, and labs. Study content is also a subject for the estimation.

8. Prerequisite Reading

Please confirm the date, time, the place and the contents of each lecture and practice beforehand. Please participate in discussion actively.

9. Reference Materials

Operative Oral and Maxillofacial Surgery/ John D. Langdon, Peter A. Brennan: Hodder Education, 2011

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Kiyoshi Harada　TEL　5803-5498　E-mail　haradak.mfs@tmd.ac.jp Mon:13:00～17:00, Fri:10:30～12:00

13. Note(s) to students

None

Maxillofacial Orthognathics

Lecture	(code:	８２８１	1st year	:6units)
Practice	(code:	８２８２	1st～2nd year	:4units)
Lab	(code:	８２８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor　Keiji Moriyama　 Associate Professor　Shoichi Suzuki
Junior Associate Professor　Takuya Ogawa
Assistant Professor　Michiko Tsuji, Norihisa Higashihori,
Jun Miyamoto,Yukiho Kobayashi
Contact person: Shoichi Suzuki　E-mail s-suzuki.mort@tmd.ac.jp

2. Classroom/Lab

Information will be provided from the instructor beforehand.

3. Course Purpose and Outline

The purpose of this program of Maxillofacial Orthognathics is to provide information related to craniofacial growth and development, and stomatognathic function in order to develop basic knowledge and skills for the treatment of the patients with a wide variety of malocclusion. It also provides valuable information of diagnosis, and treatment planning, for orthodontic and orthognathic therapies of the patients with jaw deformities and congenital craniofacial anomalies.

4. Course Objective(s)

The objectives of the program are to explain not only the mechanism to cause congenital anomalies and growth abnormalities of the musculoskeletal system in craniofacial region, but also diagnosis and treatment planning.

5. Format

a small group

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

This couese aims to provide an advanced understanding of the anormalies in craniofacial region caused by prenatal or postnatal growth abnormalities from the aspect of the clinical dentistry. In addition, it provides valuable knowledge on genetic background in various congenital diseases, and the latest information of diagnosis and treatment planning.

Available programs:

Course Lecture　Apr. 3- Mar. 25 - Friday　8:00～9:00
Special Lecture　Nov, 27th, 17:00～
Seminar　17:00～19:00 - Fridays

Practice

Comprehensive care by a team of specialists including maxillofacial surgeons, orthodontists, prosthodontists, speech therapists etc. is needed for the treatment of the patients with cleft lip and palate and other craniofacial anomalies.　The Graduate Program provides the clinical education of orthodontics as a part of the multi-disciplinary approach for such patients.

Available programs:

Clinical meetings　Schedule will be informed by instructors.
Research seminar　Schedule will be informed by instructors.
Professor diagnosis　Tuesdays and Fridays
FD conferences　15:00～16:00 - every other Friday
CLP conferences　15:00～16:00 - Friday

Lab

The laboratory research course provides education on basic and clinical sciences of craniofacial growth and development, such as molecular biology and molecular genetics of congenital anomalies. It also includes clinical and epidemiological studies on a wide variety of malocclusion and orthodontic treatment.

Available programs:

Participation in research group voluntary

7. Grading System

Grading will be performed based on achievement of the study, as well as a record of attendance to lectures, clinical practice and laboratory research.

8. Prerequisite Reading

Prior to a lecture, practice and lab, confirm lecture contents and learn necessary knowledge by reference books beforehand.

9. Reference Materials

Contemporary Orthodontics 5th Ed., W.R.Proffit, MOSBY ・Orhodontics Current Principles & Techniques 4th Ed., T.M.Graber, ELSEVER/MOSBY ・Contemporary Treatmnet of Dentofacial Deformity, W.R.Proffit, MOSBY ・Gorlin's Syndrome of the Head and Neck, 5th Ed., Hennekam/Krantz/Allanson, Oxford University ・Atlas of Orthodontic Treatment for Patients with Birth Defects, T.Kuroda, Needham Press

10. Important Course Requirements

nothing in particular

11. Availability in English

Available

12. Office Hour

Contact by email.

13. Note(s) to students

None

Maxillofacial Prosthetics

Lecture	(code:	８２９１	1st year	:6units)
Practice	(code:	８２９２	1st～2nd year	:4units)
Lab	(code:	８２９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Hisashi Taniguchi.
Junior Associate professor Yuka Sumita,
Assistant professor Mariko Hattori, Takafumi Otomaru
Contact person :Yuka Sumita Junior Associate Professor E-mail yuka.mfp@tmd.ac.jp

2. Classroom/Lab

Lecture: room of Maxillofacial prosthodontics 2nd floor of research and educational Building
Practice and Lab: room of clinic for maxillofacial prosthetics 6th floor of dental hospital building

3. Course Purpose and Outline

Department of Maxillofacial Prosthetic is the special unit of the prosthodontic and/or prosthetic treatment for patients with defects in oral and/or maxillofacial regions.

4. Course Objective(s)

The main objective of this course is to provide students with opportunity to gain sound understanding of the restoration of functional and esthetic disorders of oral and/or maxillofacial areas that are caused by congenital developmental or acquired diseases by means of the high-advanced dental and medical cares.

5. Format

Lecture and discussion. Every candidate has to address their own opinion freely to the others.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The main objective of this course is to provide students with opportunity to gain sound understanding of the restoration of functional and esthetic disorders of oral and/or maxillofacial areas that are caused by congenital developmental or acquired diseases by means of the high-advanced dental and medical cares.

Available programs:

Lecture:Tuesday 16:00～17:00 and/or Wednesday 17:00～18:00 of May.12-July.14 at room of Maxillofacial prosththeticss 2nd floor of research and educational Building (10thbuilding)
Special Lecture: Contact us by e-mail.
Seminar:17:00～18:00every Wednesday at 2nd floor Maxillofacial prosthetics department room of research and educational Building (10th building)

Practice

Goals/Outline:
In order to master the treatment planning and the prosthetics diagnosis for the maxillofacial patients, join the clinical work at 6F clinic room of dental hospital building, Yushima Campus.

Available programs:

Professor's diagnosis :
9:00～10:00 every Wednesday at 6F clinic room of dental hospital building
CLP conference:
15:00～16:00 4th Friday at 6F oral surgery clinic room of dental hospital building

Lab

Goals/Outline:
Our department is the special unit for the prosthetics treatment for patients with congenital or acquired defects in head and neck regions. The main goal of the research is to establish a novel theory and feedback it to the clinic to improve the quality of life of each patient. In this respect, we are focusing on several projects as follows.
1. Diagnosis of functional impairment in patients with a maxillofacial defect
2. Treatments for functional rehabilitation of patients with a maxillofacial defect
3. Evaluation on masticatory function in patients with a maxillofacial defect
4. Speech evaluation in patients with a maxillofacial defect
5. Development of new materials for facial prosthesis

Available programs:

Participation in research group voluntary

7. Grading System

Comprehensive assessment is done including attendance if lecture, practice and labo-work.
The percentage of attendance of the class 60% , The class participation attitude 40%

8. Prerequisite Reading

Pllease read a textbook prior to attend the class.

9. Reference Materials

Maxilloffacial Rehabilitation 3rd edition Quintessence book written by John Beumer Ⅲ

10. Important Course Requirements

Attend the classes 2/3 over.

11. Availability in English

Available

12. Office Hour

08:30-17:00 Mon-Fri

13. Note(s) to students

If necessary, please contact us by e-mail. yuka.mfp@tmd.ac.jp

Cell Biology

Lecture	(code: ７０４１	1st year	:6units)
Practice	(code: ７０４２	1st～2nd year	:4units)
Lab	(code: ７０４３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Akihiro Inoue　E-mail　inoue.cbio@tmd.ac.jp

2. Classroom/Lab

Cell biology laboratory (18F M&D tower)

3. Course Purpose and Outline

the course covers introduction to modern cell biology.

4. Course Objective(s)

Major discovery of cell biology will be presented and why the discovery weree achieved will be discussed.

5. Format

Small group　(less than 5 participants)

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　Principles and techniques of cell biology will be reviewed from historical point of view. Emphases are made on the fine structure of the cells and the power of microscopy.

Available programs:

Special Lecture　Fine Structure of the Cells
Seminar　Cell Biology Seminar
Journal Club　Cell Biology Journal Club (Every Monday PM3:00)

Practice

Goals/Outline
　Participants will learn how to design experiments and evaluate the results under the supervision of our staffs, using the data of on-going projects in our lab.

Available programs:

Practice of Cell Biology

Lab

Goals/Outline:
　Basic cell biology techniques will be presented including cell culture, transfection, and light-microscopy

Available programs:

Cell Biology Lab

7. Grading System

Students will be graded by their participation

8. Prerequisite Reading

nothing special

9. Reference Materials

mollecular biology of the cell..

10. Important Course Requirements

nothing special

11. Availability in English

lecture will be held in Japanese, however we can tell the foreign students the corresponding pages of the text books in Englishm

12. Office Hour

10:00-17:00

13. Note(s) to students

The language used in lectures will be English

Medical Biochemistry

Lecture	(code: ７０５１	1st year	:6units)
Practice	(code: ７０５２	1st～2nd year	:4units)
Lab	(code: ７０５３	2nd～3rd year	:8units)

1. Instructor(s)

Yutaka Hata (Full professor) and three assistant professors.
Contact person: Yutaka Hata　E-mail　yuhammch@tmd.ac.jp

2. Classroom/Lab

To be announced when scheduled.

3. Course Purpose and Outline

We are studying the tumor suppressive Hippo pathway and RASSF proteins.　They are essential in the regulation of cell proliferation, cell polarity, cell differentiation and cell death　They play important roles in various human diseases and could be new therapeutic targets.　We give lectures about our current studies to graduate students and others, and provide graduate students with the opportunity to participate in them.

4. Course Objective(s)

The students are requested through these courses to obtain a comprehensive integrated knowledge of the Hippo pathway and RASSF proteins, and to understand which roles it plays to maintain human health and how its dysregulation causes human diseases.

5. Format

Please consult the contact person.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
We are studying a new signaling pathway and its related proteins (Hippo pathway and RASSF), which are involved in the regulation of cell proliferation, cell polarity, cell differentaion, and cell death.　This pathway and proteins are well conserved from fly to human.　The mutations of some components lead to oncogenesis and organ malformation.　Several recent studies suggest that Hippo pathway and RASSF are implicated in inflammation and cell differentiation such as adipogenesis, osteogenesis, and keratinocyte differentiation.　They play important roles in not only caner but also other diseases and could be new therapeutic targets.　We give lectures about our current studies.　To learn more about our research, please visit our Web page (http://www.tmd.ac.jp/english/mbc/index.html).

Available programs:

Lecture　To be announced when scheduled.
Special Lecture　To be announced when scheduled.
Seminar　To be announced when scheduled.
Journal Club　Saturday morning.
Conference　To be announced when scheduled.

Practice

Goals/Outline:
　To gain a wide knowledge of cancer biology and epigenetic changes underlying various human diseases through the study on Hippo pathway and RASSF.

Available programs:

Weekly progress report.　Friday evening or Saturday morning.

Lab

Goals/Outline:
To perform biochemical, molecular biological, and cell biological experiments to study Hippo pathway and RASSF.

Available programs:

Participation in our research.

7. Grading System

Please consult the contact person.

8. Prerequisite Reading

Please read the standard textbooks, such as "Molecular Biology of the Cell".

9. Reference Materials

Kodaka and Hata: The mammalian Hippo pathway: regulation and function of YAP1 and TAZ.
Cell Mol Life Sci. 2015 Jan;72(2):285-306. doi: 10.1007/s00018-014-1742-9. Epub 2014 Sep 30.

10. Important Course Requirements

Punctuality.

11. Availability in English

Lectures are given in English for foreign students. All students inculding Japanese are requested to introduce papers in English for the Journal Club.

12. Office Hour

No fixed office hour, but you can get contact with Professor Hata through the e-mail to have an appointment if necessary.

13. Note(s) to students

Please do not fail to get more detailed information in advance before you determine to select this course.

Joint Surgery and Sports Medicine

Lecture	(code: ７０６１	1st year	:6units)
Practice	(code: ７０６２	1st～2nd year	:4units)
Lab	(code: ７０６３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Takeshi MUNETA
Contact person: Hideyuki Koga E-mail koga.orj@tmd.ac.jp

2. Classroom/Lab

Venues are different according to the program.

3. Course Purpose and Outline

To understand the anatomy, physiological function, and disease of joint tissue. To understand the process of articular cartilage degeneration and discuss the current topics for joint regeneration therapy. To learn technics for isolation, expansion and differentiation of tissue derived mesenchymal stem cells in adults.

4. Course Objective(s)

Clinicals: The goal of this course is to train graduate students in the majority to begcome established orthopedic surgeons who have expertise in joint related diseases and who have abundant experience to decide the most effective treatment against joint diseases. Science: The goal of this course is to train graduate students to acquire experimental skills related to cell transplantation therapy, such as isolation and mentenance of tissue derived mesenchymal stem cells, basic molecular biological techniques (Q-PCR, Microarray, etc.), histology, and basic cellular biological techniques (Flowcytometry etc.).

5. Format

Small group lectures are performed. Round of talks for reports and discussions on research are held as many as possible.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Bone and joint system which support living body consists of bone, cartilage, tendon, ligament, and muscle tissues. These tissues with these own characteristic maintain function from an early development to death. These tissues go through the distinctive process of degeneration and healing against diminished ability to maintain function and injury. Clarification of the background of the tissue degeneration, prevention of these degeneration, treatment procedure, and promotion and control of the healing are studied.

Available programs:

Lecture As needed
Special Lecture As needed
Seminar As needed
Journal Club Every Thursday 7:30-8:30
Every Friday 7:30-8:30

Practice

Goals/Outline:
The pathology and problems of the representative disease and injuries of bone, cartilage, tendon, ligament, and muscle tissues are studied, and diagnostic technique by physical examination, image studies, and pathology will be acquired. Diagnostic methods, examination procedures, and treatment procedure for bone and joint disease and injuries will be acquired, and therapeutic strategy and practice against bone and joint disease and injuries are studied.

Available programs:

Conference at the hospital ward: every Monday 7:35-8:45
every Monday 16:30-17:30
Ward round: every Monday 14:30-16:00
every Monday 17:00-17:30
Research progress: every Tuesday 7:30-8:30

Lab

Goals/Outline:
Following studies have been extensively carried out in out laboratory with various biological and molecular biological techniques:
- Establishment of separation and proliferation of mesenchymal stem cells
- Elucidation of biological properties of mesenchymal stem cells
- Development of treatment of joint cartilage injury using mesenchymal stem cells
- Mechanism and treatment of joint pain
- Development of knee and hip arthroplasty which accommodates Japanese
- Promotion of anatomical knee anterior cruciate ligament reconstruction

Available programs:

Participation in a research group: As needed

7. Grading System

Grading are performed in a comprehensive way based on the lecture, practice, and laboratory participation situation, reports about research, and conference presentations.

8. Prerequisite Reading

At least two to three research themes will be picked up for each student. Students will be required to understand the background, purpose, and significance of each research theme and must plan the experiments (staffs will help this process).

9. Reference Materials

For scientific topics, please refere "Stem Cells, Arthritis and Rheumatology, and Osteoarthritis and Cartilage. For clinical topics, please refer to American Journal of Sports Medicine, Arthroscopy, Clinical Orthopedics and Related Research, Arthroplasty, and KSSTA Journal.

10. Important Course Requirements

Each graduate student will be carefully mentored from staffs and senior students with regard to his/her PhD research themes. All students must join and discuss their reserch progresses at least once a month.

11. Availability in English

Available

12. Office Hour

9:00 - 17:00; E-mail to Hideyoki Koga: koga.orj@tmd.ac.jp

13. Note(s) to students

Biostructural Science

Lecture	(code:	８３０１	1st year	:6units)
Practice	(code:	８３０２	1st～2nd year	:4units)
Lab	(code:	８３０３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor Makoto Tabata
Contact person: Makoto Tabata E-mail tabatamj.bss@tmd.ac.jp

2. Classroom/Lab

Lecture: Seminar room in M & D Tower (Room number needs to be confirmed at the Students' Office)
Practice & Lab works: Biostructural Science Laboratory (8th floor, M & D Tower)

3. Course Purpose and Outline

Study of Histology and Embryology of the Hard tissues of Tooth and Bone

4. Course Objective(s)

You know the distinctive specification of the Hard tissue study, and you will be able to choose the suitable methodology for your reseach.

5. Format

Generally, expert tutor(s) will be assigned to one graduate student and give necessary advice from the 1st year of the 4 - year - course.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Introduce structural features and organization of bones, teeth and other biological mineralized tissues at both macroscopic and microscopic levels, and elaborate of detailed mechanisms of formation, destruction, and remodeling of these intriguing tissues. Basic mechanisms of biological mineralization and its diversity among various cells, tissues and species of animals are also referred to.

Available programs:

Weekly Lectures for Graduate Students Oct 29 - Dec 17 (Thursday 17:00-18:30)
Special Lecture occasional

Practice

Goals/Outline:
Using available data and published materials, review and evaluate the experimental strategies used in the respective studies and, through group discussions, understand the importance of the choice of proper method and its application.

Available programs:

Power Lunch program combined with Journal Club

Lab

Goals/Outline:
Experience various methods of animal and/or human tissue processing and learn basic methods of microscopy and histo-cytochemistry combined with molecular biology, essential for understanding structure and function of cells, tissues and organs.

Available programs:

Practical course program will be designed for the individual graduate students measuring Biostructural Science.
Graduate students may also be involved in one or more of the ongoing research projects.

7. Grading System

Comprehensive evaluation based on attendance, attitude, and competence.

8. Prerequisite Reading

You need fundamental knowledge of Hard tissue, i.e., the structure, the components, the development of the tooth and bone

9. Reference Materials

"Koku no Hassei to Soshiki" 3ed, Nanzando
"Senshoku Bio-imaging Jikken Handbook" Yodosha

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

occasional

13. Note(s) to students

None

Pharmacology

Lecture	(code:	８３１１	1st year	:6units)
Practice	(code:	８３１２	1st～2nd year	:4units)
Lab	(code:	８３１３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Kazuhiro Aoki
Assistant Professor: Yukihiko Tamura
Lecturer: Setsuko Mise, Kiichi Nonaka

2. Classroom/Lab

Laboratory rooms for the pharmacology (M & D tower, 7th floor, south side)
Seminar and lecture rooms of M & D tower

3. Course Purpose and Outline

Knowledge about hard tissue pharmacology is acquired through experimental studies *in vivo,* discussing the pharmacological actions exerted on bones and teeth.

4. Course Objective(s)

The goal of this class is to acquire information about pharmacological and histomorphometric approach, skills for hard tissue processing, and overall knowlidge related to bones and teeth, and to be a person who can argue in the interdisciplinary field of studies in English.

5. Format

Make small number of member to perform research theme independently.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Make lectures concerning the drugs that affect the formation and resorption process of hard tissues such as bone and teeth and also provide information about the necessary techniques for hard tissue research.

Available programs:

Lecture Course Lecture Jun. 16- Jul. 14 - Tuesday 14:00～16:00
Special Lecture 4 Lectures: 2 Mondays of July, Each once on Monday of November and February, 17:30-19:30
Seminar at any time
Journal Club Every Wednesday, 8:20-9:00
Bone club Every Friday, 8:20-9:00 (Discussion in English)

Practice

Goals/Outline:
Make lectures for every topic of the research theme, discuss with them by obtaining the related papers and the research results and know the points and the background of research. Final goal is to make research plan, do experiments, and summarize data by themselves.

Available programs:

Bone club and journal club of each research group. At any time

Lab

Goals/Outline:
Join each research group and know the techniques for hard tissue research. Final goal is to do perform experiments using these techniques and to evaluate the research data.

Available programs:

Join the research group. At any time

7. Grading System

An overall assessment (grading) is perfomed based on the following points; 1) the participating rate of lectures, special lectures, and seminars, 2) the attitude toward academic meetings, 3) the submission of report on the indicated subjects, 4) freuency of presentation at academic meetings, 5) the behavior in class including the practical training.

8. Prerequisite Reading

Learing fundamentals of Pharmacology and Tissue Engineering is requirement.

9. Reference Materials

Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism. Wiley-Blackwell

10. Important Course Requirements

It is better to make brush-up both the ICT levels for document retrieval and the English conversation skill.

11. Availability in English

Available

12. Office Hour

Contact person: Kazuhiro Aoki E-mail: kazu.hpha@tmd.ac.jp

13. Note(s) to students

None

Connective Tissue Regeneration

Lecture	(code: ８３２１	1st year	:6units)
Practice	(code: ８３２２	1st～2nd year	:4units)
Lab	(code: ８３２３	2nd～3rd year	:8units)

1. Instructor(s)

Tamayuki Shinomura, Associate Professor
Contact person:T. Shinomura　　E-mail　t.shinomura.trg@tmd.ac.jp

2. Classroom/Lab

Since a venue depends on the program, please ask a contact person before taking part in the course.

3. Course Purpose and Outline

Connective tissues such as cartilage, bone, skin, and so on are characterized by the presence of abundant extracellular matrix. Therefore, their functions are highly dependent on the properties of their extracellular matrix. So, first of all, biochemical and molecular biological properties of extracellular matrix will be explained. Then, on that basis, we will have a better understanding of molecular background of how functional properties of each tissue are raised.

4. Course Objective(s)

To understand the properties of connective tissues and their functions, it is essential for us to understand the behavior of extracellular matrix molecules. So, the goal of this course is to give you basic knowledge of extracellular matrix necessary for studying connective tissues and to give you skills that you will need to read any paper related to your own study with ease.

5. Format

In an intimate setting, we want to have frank discussions with students as much as possible.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Connective tissues including cartilage, bone, skin, oral tissues, and so on are characterized by the presence of abundant extracellular matrix, ECM. Therefore, to gain a better understanding of these tissues, it is essential for us to know the molecular background of ECM. The lecture will concentrate especially on the molecular properties of cartilage matrix and the regulation of their genes during cartilage tissue formation. In addition to ECM molecules, we will be focused on the transcription factors that control the chondrogenic differentiation and the expression of cartilage characteristic ECM molecules such as type II collagen and aggrecan. After gaining the understanding of molecular mechanisms underlying a cartilage tissue formation, we would like to discuss the challenges for the future in the field of hard tissues regeneration.

Available programs:

Lecture, from Oct. 27 to Nov. 24 (Tue. 10:00 ～ 12:00)
Special Lecture, on an as-needed basis
Journal Club (Extracellular matrix and secretory mechanism), Every Thursday 16 : 00 - 17 : 00

Practice

Goals/Outline:
Based on the latest research developments of cartilage, specific and general discussions will be held to invent and to stimulate new research.

Available programs:

Progress meeting (Cartilage), Every Thursday 10 : 00 - 12 : 00

Lab

Goals/Outline:
Students can acquire basic technology related to the regulation of gene expression using established chondrogenic cell lines.

Available programs:

Participation in our research group, on an as-needed basis

7. Grading System

The participation rate in programs will weigh heavily (80%) in grade calculations. The comprehensive evaluation will be conducted based on the active participation in the programs.

8. Prerequisite Reading

You are required to learn a very basic knowledge of glycobiology by yourself using a textbook such as Biochemistry (eds: Lubert Stryer et. al) as a reference.

9. Reference Materials

Biochemistry. 7th ed. (eds: Lubert Stryer et. al) W.H. Freeman and Company, New York, 2012
Molecular Cell Biology. 7th ed. (eds: Harver Lodish et. al) W.H. Freeman and Company, New York, 2013

10. Important Course Requirements

None

11. Availability in English

Available (on request)

12. Office Hour

Anytime; Contact person: T. Shinomura (Connective Tissue Regeneration) , E-mail t.shinomura.trg@tmd.ac.jp

13. Note(s) to students

None

Biochemistry

Lecture	(code:	８３３１	1st year	:6units)
Practice	(code:	８３３２	1st～2nd year	:4units)
Lab	(code:	８３３３	2nd～3rd year	:8units)

1. Instructor(s)

Miki Yokoyama, Associate Professor; Yasuhiro Kumei, Lecturer; Katarzyna Anna Podyma-Inoue, Assistant Professor; Akira Asari, Part-time Lecturer

Contact person: Miki Yokoyama E-mail m.yokoyama.bch@tmd.ac.jp

2. Classroom/Lab

Since a venue depends on the program, please ask a contact person before taking part in the course.

3. Course Purpose and Outline

This class aims at understanding of health and disease based on molecular structures of biomolecules associated with plasma membranes.

4. Course Objective(s)

The purpose of this class is to discuss the heterogeneity within plasma membranes and its physiological significance, by especially focusing on structural aspects of sphingolipids. The roles of sphingolipid-derived bioactive molecules are also discussed.
The class also explains structure and function of extracellular matrix (ECM). The components of ECM with the focus on collagen and proteoglycans under normal and pathological conditions are discussed.

5. Format

Small group seminars

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Background, recent progress, physiological importance, experimental approaches and unresolved problems of membrane domains, which depends on chemical properties of phospholipids, sphingolipids, and cholesterol, are explained. Participants will understand the relation between the lipid molecules and the membrane through the molecular model building of each lipid molecule. In addition, the role of sphingosine-1-phosphate, as a typical example of sphingolipid-derived bioactivie molecule, is discussed. Recent progress, physiological importance and experimental approaches to study the extracellular matrix, especially heparan sulfate proteoglycan, chondroitin sulfate proteoglycan, and hyaluronan (hyaluronic acid), are explained. Besides these main programs, the mechanism of some diseases in the hard tissues is evaluated by using the actual model of disease such as mechanical unloading on bone demineralization or osteoporosis.

Available programs:

Lecture 10:00-12:00 on every Wednesday (May13 to June 24 in 2015)
Journal Club 16:00 - 17:00 on every Thursday
Text book Club 13:30 - 15:00 on every Thursday

Practice

Based on the latest progresses on lipids or carbohydrates, specific and general discussions will be held to invent and to stimulate new research.

Available programs:

Journal Club 16:00 - 17:00 on every Thursday

Lab

Goals/Outline:
Students are required to present experimental data for discussion, which will be a crucial step to evaluate and improve the research progress.

Available programs:

Progress report (English) 10:30 - 12:00 on every Thursday

7. Grading System

Attendance to lectures, seminars, laboratory practices is evaluated. In addtion, research progress or presentation at the meeting is also evaluated totally.

8. Prerequisite Reading

Please attend a class with some information of your research materials.

9. Reference Materials

Molecular Biology of the Cell, Fifth Edition (Garland Science)

10. Important Course Requirements

None

11. Availability in English

Available. A part of our course has been conduced by "All in English" style for students since 2000.

12. Office Hour

Miki Yokoyama (E-mail m.yokoyama.bch@tmd.ac.jp)

13. Note(s) to students

None

Cell Signaling

Lecture	(code:	8 3 4 1	1st year	:6units)
Practice	(code:	8 3 4 2	1st～2nd year	:4units)
Lab	(code:	8 3 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Principal investigator (Associate Professor): Tomoki Nakashima
(Assistant Professor):Mikihito Hayashi
Adjunct Lecturers: Hiroshi Takayanagi (University of Tokyo)
Contact person: Tomoki Nakashima E-mail naka.csi@tmd.ac.jp

2. Classroom/Lab

Please contact the instructor in charge before the course.

3. Course Purpose and Outline

Students will learn the basis of the life science by understanding the fundamental mechanism of intracellular signal transduction that regulates a variety of cellular functions including cell survival, death, proliferation and differentiation.

4. Course Objective(s)

Students will learn basic molecular biology and genetic engineering techniques by observing and/or performing biochemical experiments using cultured cells and knockout mice.

5. Format

Participatory class by a small group.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Students will learn the basis of the life science by understanding the fundamental mechanism of intracellular signal transduction that regulates a variety of cellular functions including cell survival, death, proliferation and differentiation. In addition, students will learn the molecular bases of disease therapies by understanding the abnormalities of intra- and/or intercellular signal transduction pathways underlying pathological conditions.

Available programs:

Lecture May. 9 to Sep. 18 Friday 12:00 - 14:00 (at the seminar room on the 8th floor in the M&D tower)
Special Lecture To be announced

Practice

Goals/Outline:
Students will experience the experimental and analytical process of advanced science. Under the supervision of staffs, students will join the analysis of data obtained from experiments. Our major research interests include:
1. Signal transduction mechanisms that regulate the differentiation of osteoclast, osteoblast and osteocyts important cell lineages that regulate bone remodeling.
2. Regulation of bone remodeling by molecules in the immune and locomotive systems.
3. Signal transduction in bone destructive diseases and development of clinical applications.

Available programs:

Progress conference To be announced

Lab

Goals/Outline:
Students will learn basic molecular biology and genetic engineering techniques by observing and/or performing biochemical experiments using cultured cells and knockout mice.

Available programs:

Participation in study groups　To be announced

7. Grading System

Based on the attendance rate and presentation in recture and scientific meeting, we perform a general evaluation.

8. Prerequisite Reading

Under the supervision of staffs, students will prepare review presentation of scientific journal.

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

Available, rise to the occasion

12. Office Hour

Contact person: Tomoki Nakashima E-mail naka.csi@tmd.ac.jp

13. Note(s) to students

Limited number: none
Please contact the instructor in charge before the course.

Inorganic Materials

Lecture	(code:	８３５１	1st year	:6units)
Practice	(code:	８３５２	1st～2nd year	:4units)
Lab	(code:	８３５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kimihiro YAMASHITA,　Associate Professor: Miho NAKAMURA, Assistant Professor: Naohiro HORIUCHI
Contact person: Naohiro HORIUCHI　E-mail　nhori.bcr@tmd.ac.jp

2. Classroom/Lab

Department of Inorganic Materials, Institute of Biomaterials and Bioengineering
http://www.tmd.ac.jp/i-mde/www/index.html

3. Course Purpose and Outline

This course presents the opportunity to study the recent progress in fundamentals and clinical applications of bioceramics. Topics are picked up from the related papers published in the internationally prominent journals. Investigation of regenerative medicine is also the target of this course to discuss bioceramics as new clinical materials.

4. Course Objective(s)

To learn the fundamental subjects such as structure, synthesis and properties, and to apply the skills to basic research as well as to apply the knowledes to dental and deical clinics.

5. Format

Small group

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The objective and principle of the department of Inorganic Materials is to educate students with materials knowledge demanded to medical and dental doctors who are leading medical professionals and bioscientists who are capable of carrying out their own research at a international level in the area of their special fields of science, respectively. Bioceramics such as hydroxyapatite and tricalcium phosphate have been clinically applied for inorganic substitutions in orthopedic and dental field. Main objective of bioceramics in the graduate course is to provide students opportunity to study ceramic materials science such as structure and synthesis, and also study materials characterization technology. Students are also taught on investigation of osteoconductive mechanism by bioceramics. For deeper understanding, this lecture is to be undertaken with the professors of the department of Biomaterial Biofunctions.

Available programs:

Lecture　Monday
　Special Lecture　A/N
Seminar　A/N
　Journal Club　Friday
　　Conference　　Thursday

Practice

Goals/Outline:
We have developed educational programs which enable students to acquire interdisciplinary and extensive material knowledge, while cultivating a research-oriented mindset. Students are tought to understand research trends and opinions on bioceramics.

Available programs:

Lab seminar: Friday (10:00-12:00)
Journal Club: Thursday (16:00-17:30)

Lab

Goals/Outline:
We have developed our existing curriculum significantly so that students can, through tutorials, acquire not only extensive material knowledge but also advanced research skills.

Available programs:

Experiment (Synthesis of ceramic powder, making of ceramics and biological assessments): A/N

7. Grading System

The student should attend at least %80 of all lectures and seminars. Grades are determined by the attendance and participation in class discussion, the quality of the presentations and the progress of the individual research project including .

8. Prerequisite Reading

Ideally, the study of basic chmeistry and preliminbary bioceramics.

9. Reference Materials

An introduction to ceramics. Ceramic Biomaterial (in japanese).

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Assistant prof. Naohiro Horiuchi (e-mail: nhori.bcr@tmd.ac.jp).

13. Note(s) to students

We desire participation of highly-motivated students.

Periodontology

Lecture	(code: 8361	1st year	:6units)
Practice	(code: 8362	1st～2nd year	:4units)
Lab	(code: 8363	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Yuichi Izumi　Associate Professor: Hisashi Watanabe　Lecturer: Akira Aoki
Contact person: Hisashi Watanabe　E-mail watanabe.peri@tmd.ac.jp

2. Classroom/Lab

Demonstration room of Hozon-Kyosei at 5th floor of Building No.7 and several seminar rooms

3. Course Purpose and Outline

The purpose was to clarify the outcomes and problems of the current periodontal research. For the sake of the purpose, it is necessary to collect the current information of peridontal research, to clarify the problems being wrestled in future, to find out the novel method to be solved and train for making research plan.

4. Course Objective(s)

1.To be able to explain the mechanism of the initiation of periodontal disease 2. To be able to explain the association between periodontal and systemic diseases 3. To be able to explain the mechanism of periodontal regeneration and its treatments

5. Format

Small class and setting up discussion time as much as possible in order to promote mutual understanding

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To educate etiology of periodontal diseases, host response, oral bacteria, periodontal medicine, regenerative therapy and so on profoundly, and to find a solution through discussion research outcomes as to periodontal destructive process and periodontal treatment modalities

Available programs:

Lecture　May. 8 to July. 10　every other Friday 10:30～12:00
Special Lecture　every other Friday 17:00～19:00
Seminar　every other Friday 17:00～18:30
Clinical Conference　every Friday　16:30～17:30
Journal Club　every Friday　17:30～18:30

Practice

Goals/Outline:
To collect information as to current trend of periodontal research by literature and Internet in addition to discuss and investigate novel research approaches

Available programs:

Journal Club　Friday 17:30～18:30

Lab

Goals/Outline:
To examine model animals and periodontal patients by the methods of microbiology, molecular biology, immunology and so on in order to elucidate etiology and pathology of periodontal diseases

Available programs:

Participation in a research group　occasionally

7. Grading System

Grading will be performed by evaluating synthetically using attendance status to lecture, practice and lab and individual research contents

8. Prerequisite Reading

Make sure to collect the novel information of the current periodontal research through Pub Med, Medline and Inter net.

9. Reference Materials

Journal of Periodontology, Journal of Clinical Periodontology, Journal of Periodontal Research, Nature, Science

10. Important Course Requirements

Make sure to attend the course as much as possible.

11. Availability in English

Available

12. Office Hour

Associate Professor Hisashi Watanabe, watanabe.peri@tmd.ac.jp　17:00-18:30

13. Note(s) to students

Lecture will be given in English occasionally

Global Health Promotion

Lecture	(code:	７０７１	1st year	:6units)
Practice	(code:	７０７２	1st～2nd year	:4units)
Lab	(code:	７０７３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor, Keiko NAKAMURA, MD, PhD
Lecturer, Masashi KIZUKI, MD, MPH, PhD; Lecturer, Kaoruko SEINO, MMS, PhD
Assistant Professor, Ayako MORITA, MMS, PhD
Contact person: Associate Professor Keiko NAKAMURA E-mail: nakamura.ith@tmd.ac.jp

2. Classroom/Lab

Lectures are held in lecture rooms (Graduate Lecture Room 2, M&D Tower, 13th FL; Graduate Lecture Room, 3rd Building, 6th FL; other rooms). Auditoriums are used for special lectures. Venue for practices and labs should be confirmed with instructors.

3. Course Purpose and Outline

The purpose of this course is to help prepare health professionals as leaders in the field of public health and health promotion. This course provides overview of global public health and health promotion and analytical methodologies addressing disease prevention, health and quality of life and environment at local, national and international settings. Participants will learn the concept of public health and health promotion, specialized skilles and knowledges necessary to communicate and produce quantitative and qualitative information, and strategies to integrate academic wisdom to public health policies and practices.

4. Course Objective(s)

At the completion of the course, participants are expected to be able to:
(1) Explain theoretical framework and history of public health and health promotion with global and local perspectives
(2) Assess health and wellbeing of the populations as well as risk of diseases by using quantitative and qualitative data, analyze critically based on evidence with multifaceted approaches
(3) Determin appropriate uses and limitations of main quantitative and qualitative data and data analysis methods (Epidemiology, surveillance, health economic analysis, health impact assessment, meta analysis, participatory evaluation, others)
(4) Apply ethical principles to the collection, maintenance, use, and dissemination of data and information with understandings and respects of cultural and other background issues
(5) Identify public health problems at local, national and international settings, develop a research protocol to addressing solutions, and conduct research including field work when necessary
(6) Apply sampling, data collection processes, and information technology applications effectively and productively in an actual environment
(7) Produce high-quality research results and workable solutions that meet community health needs
(8) Report and disseminate information and opinions in a structured and credible way, and to ensure that messages have been heard and understood by the intended audience

5. Format

Lectures, group discussions, and team project. English is used in principle.

6. Course Description and Timetable

Check with teachers in charge for the program which is not specifically scheduled.

Lecture

Outline: Demographic and environmental changes and rapid urbanization, are affecting the health and quality of life of people around the world. Academic endeavors to deepen understanding of the physical, social, cultural, and economic aspects of human-environmental interactions are fundamental to strengthen human security. Topics include overviews of major fields of global public health; human security; diverse regional issues from around the world; health equity; global environmental changes and health; health in cities; determinants of health; health promotion and education; family health; health systems around the world; field epidemiology; measuring individual and population health; evaluation of health programs; public-private partnership for health; and international health cooperation. Opportunities to read and evaluate scientific journals, share interpretations of them, and to stimulate new ideas about various problems and issues in public health are arranged. Participants are encourages to present their views and learn from others.

Available programs:

Regular Lecture, Tuesday, 10:00-12:00
Seminar, Thursday, 10:00-12:00
Special Lecture, To be announced

Practice

Outline: Individual practicums address the quantitative and qualitative methods necessary in the assessment of health and quality of life of population and environmental qualities at local, national, and international settings and address the evaluation of the effectiveness of health interventions and programs. Opportunities to advance academic skills of critical reading of original research work in public health, knowledge of ethics for public health research and its practical applications, and professional skills and attitudes required for international health leaders are provided. Technical visits to health promotion related sites and institutions are also arranged.

Available programs:

Case Study Seminar, Thursday, 14:00-16:00
Academic presentation, To be announced
Analysis and computing, Monday-Friday
Professional writing, Monday-Friday
Technical visit, To be announced

Lab

Outline: Opportunities of applying techniques to design, prepare, implement, analyze, and evaluate a health promotion program in actual settings in diverse geographic, social, and cultural background are offered for interested and qualified students. Instructions on writing grant proposals, ethical consideration and procedures in public health research, and professional reporting skills are also provided as necessary.

Available programs:

Independent tutorial, Monday-Friday, 8:30-17:00
Project meeting, By arrangement with individual faculty members
Field study, By arrangement with individual faculty members

7. Grading System

Grades are based on participation at lectures, practices, and field studies; performances in the projects; and levels of attitude, skills and knowledge.

8. Prerequisite Reading

Participants are expected to read materials distributed beforehand.

9. Reference Materials

Roger Detels, Robert Beaglehole, Mary Ann Lansang, Martin Gulliford. (2009) Oxford textbook of public health. 5th ed. Oxford University Press.
Fran Baum.(2008) The new public health. 3rd ed. Oxford University Press
Michael H. Merson, Robert E. Black, Anne J. Mills. (2011) Global health: diseases, programs, systems, and policies. 3rd edition. Jones and Bartlett Publishers.
Richard Skolnik. (2008) Essentials of global health. Jones and Bartlett Publishers.
Anne-Emanuelle Birn, Yogan Pillay, Timothy H Holtz. (2009) Text book of international health: global health in a dynamic world. Oxford University Press.
Kenneth J. Rothman. (2012) Epidemiology: an introduction. 2nd ed. Oxford University Press.
Ann Aschengrau, George R. Seage. (2013) Essentials of epidemiology in public health. 3rd ed. Jones & Bartlett Learning, Burlington.
International Epidemiological Association (2014) A Dictionary of Epidemiology. 6th ed. Oxford University Press.
Bernard Rosner. (2010) Fundamentals of biostatistics. 7th ed. Cengage Learning, Independence.
Marcello Pagano, Kimberlee Gauvreau. (2000) Principles of biostatistics, 2nd ed. Cengage Learning, Independence.
Groves RM, Fowler FJ, Jr., Couper MP, Lepkowski JM, Singer E, Tourangeau R. (2009) Survey methodology. 2nd ed. John Wiley & Sons, Hoboken.
Michael Marmot, Richard G. Wilkinson. (2005) Social determinants of health. Oxford University Press.
Ross C. Brownson, Elizabeth A. Baker, Terry L. Leet, Kathleen N. Gillespie, William R. True . (2010) Evidence-based public health, 2nd ed. Oxford University Press.
Karen Glanz, Barbara K. Rimer, K. Viswanath. (2008) Health behavior and health education: theory, research, and practice. 4th ed. Jossey-Bass, San Francisco.
National Cancer Institute. (2005) Theory at a glance. A guide for health promotion practice. [Internet]
Lisa F. Berkman, Ichiro Kawachi, Maria Glymour. (2014) Social epidmeiology, 2nd ed. Oxford University Press.
Richard A. Crosby, Ralph J. DiClemente, Laura F. Salazar. (2006) Research methods in health promotion. Jossey-Bass, San Francisco.

10. Important Course Requirements

Participants are required to show willingness to learn from experiences and feedbacks, and to stay active to apply lessons to improve skilles, knowledges, and performance.
Instructor's permission required before course registration

11. Availability in English

Students and instuructors use English through the course.

12. Office Hour

Wednesuday, 13:00-14:30

13. Note(s) to students

The instruction provided through courses is based on individual interests and expertise.
Intensive educational programs for working students are provided.
Collaborative programs with international organizations are prepared.
Number of participants will be limited. To attend the classes, permission of the instructors is required.

Environmental Parasitology

Lecture	(code:	７０８１	1st year	:6units)
Practice	(code:	７０８２	1st～2nd year	:4units)
Lab	(code:	７０８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Nobuo Ohta Associate Professor Nobuaki Akao Lecturer Takashi Kumagai
Contact person: Nobuo Ohta E-mail Matata.vp@tmd.ac.jp

2. Classroom/Lab

Conference room and Laboratory of Environmental Parasitology (16th Floor, M & D Tower)

3. Course Purpose and Outline

Parasitic infections are instructed from the view points of global health, biomedical importance, and public health. For these purposes, contents of the lectures include biological aspects of pathogenic parasites, clinicopathological characteristics of parasite infections, and epidimiology/public health of parasitic deiseases.

4. Course Objective(s)

(1) Understanding pathogenic parasites of humans. (2) Understanding clinical and pathologycal features of parasitic diseases. (3) Understanding the importance of parasitic diseases in Tropical Medicine and the possible applications for disease control in developing countries.

5. Format

For Lecture/Seminar, subjects are announced in advance, and students who will attend should have contact with Instructor.
For Practice/Experiment, discussion with Instructors should be done in advance, and research protocol should be aprepared.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Infectious diseases are most urgent health problem in the 21st Century on the background situations of recent rapid increases in tourism and trading, ecological changes, and/or social infrastructural development. Appearance of drug-resistant pathogens and liable human hosts to infectious diseases are additional important matters. Parasitic infections have unique features in infectious diseases because of the big impact of social culture and human behavior, and those factors make the disease control difficult. In the lecture, the unique host-parasite interactions will be introduced from the view points of in vitro and in vivo analyses, and ecology of parasites, molecular biology, immune responses of the infected hosts and others are also included in the lecture course.

Available programs:

Lecture Every 4th Wednesday (9:00～10:30)
Special Lecture Schedule will be annouced
Seminar Schedule will be annouced
Journal Club Wednesday morning
Conference Schedule will be annouced

Practice

Goals/Outline:
Diagnosis, pathogenesis and prognosis are covered by the use of clinical materials. Approaches are morphology, pathology, molecular biology and others. Philological practice is also covered.

Available programs:

Diagnosis of clinical materials: on the occasion
Field study: on the occasion
Journal club: Wednesday morning

Lab

Goals/Outline:
To understand host-parasite interactions, experimental pathological/immunological analyses of parasitic infections.

Available programs:

Parasitological experiment: on the request
Infection experiments and laboratory maintainance of parasites
Laboratory maintenance of parasite strains
Histopathology
Cell culture and immunological study
Methods for molecular study on parasites

7. Grading System

Performance at Lecture, Practice and Lab, and the qunatity and quality of publications and/or presentations at scientific meetings are evaluated.

8. Prerequisite Reading

For Journal club, it is needed to read and search reference papers and to summerize the contents of those papers in advance.
For Laboratory research, Planning, Methodology, and Results & Discussion should be well described.

9. Reference Materials

No particular books are disignated. Papers and references are guided for each research subject.

10. Important Course Requirements

It should be noted that pathogenic materials are used in this course. Therefore, each research plan should be approved in advance at committees for ethical/animal experimentation, and/or Biosafty.

11. Availability in English

English is available in the course.

12. Office Hour

Available at anytime on your request. Contact in advance is needed to Prof. Nobuo Ohta (matata.vip@tmd.ac.jp).

13. Note(s) to students

Nothing particular.

Forensic Medicine

Lecture	(code: ７０９１	1st year	:6units)
Practice	(code: ７０９２	1st～2nd year	:4units)
Lab	(code: ７０９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Koichi UEMURA Junior Associate Professor Toshihiko AKI・Kana UNUMA
Assistant Professor Takeshi FUNAKOSHI

Contact person: Koichi UEMURA E-mail kuemura.legm@tmd.ac.jp

2. Classroom/Lab

Make sure of the venue to the instructor before lecture in each program.

3. Course Purpose and Outline

Understanding of the system for the calrification of cause of death, forensic autopsy, diagnosis of cazuse of dearh, sudden dearh and death from poisoning.

4. Course Objective(s)

To obtain the ability of making a basic written statement of an expert opinion on the basis of autopsy findings.

5. Format

A small number of people

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
In both criminal and civil cases, students give a decision of the cause of death including murder cases, suicide cases and accidental cases and the intrinsic sudden death, composing of a large majority of unnatural death.
Students are also taught the form and contents of a written statement of expert opinion.

Available programs:

Lecture at any time
Special Lecture at any time
Seminar Thursday, pm1-2 (every two weeks)
Journal Club Thursday, pm1-2 (every two weeks)

Practice

Goals/Outline:
In forensic medicine, medical ethics and civil proceedings that includes medical malpractice, brain death and medical compensation, are taught. Furthermore, Students study about the criminology and situation of the injured or victim through autopsy assistance, making autopsy repot and examinations related to forensic autopsy.

Available programs:

Forensic autopsy conference on Monday am9:30-
Observation of the judicial forensic autopsy on Sunday, Monday or Tuesday , irregularly

Lab

Goals/Outline:
Mechanism of toxic effects was examined using cultured cells and experimental animals. In accordance with the novel abused drugs by the changes of society and environment, the methods of detection and identification for toxic substances are tried and developed cooperating with clinical medicine.

Available programs:

Participation in a research group at any time
Experimental Conference on Thursday

7. Grading System

Participation and struggling in lecture, practice and examination are taken into evaluation.

8. Prerequisite Reading

Undrstanding of basic forensic medicin and, terms

9. Reference Materials

Forensic mdicine, medical law based on forensic autopsy cases. Yuhikaku Boks, Ken-ichi Yoshida (2010/9/25)

10. Important Course Requirements

none

11. Availability in English

none

12. Office Hour

Koichi Uemura E-mail:kuemura.legm@tmd.ac.jp, Office hour: Sunday to Thursday

13. Note(s) to students

Nothing

Health Care Management and Planning

Lecture	(code:	7 1 1 1	1st year	:6units)
Practice	(code:	7 1 1 2	1st～2nd year	:4units)
Lab	(code:	7 1 1 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person : Kazuo Kawahara　E-mail kk.hcm@tmd.ac.jp ,　Makiko Sugawa　E-mail:sugawa.hcm@tmd.ac.jp

2. Classroom/Lab

M&D Tower 16 F Graduate student lounge of Health Care Management and Planning Division or at the conference room on the same floor.

3. Course Purpose and Outline

To understand the problems faced by public health and welfare, and to understand the determining factors of policies for improvements together with their validity and fitness for purpose.

4. Course Objective(s)

Students are expected to learn how to analyze health and welfare policies adopted domestically and overseas using objective indicators as well as the ability to theoretically and systematically discuss what they think would be the optimal solution.

5. Format

To introduce the domestic and foreign documents and papers about the latest health and welfare policies. And to analyze, discuss and evaluate these contents.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
By analyzing the Japanese healthcare policies and system and by reviewing their interaction with society, the structural characteristics and issues can be clarified. To resolve or find better ways to handle these issues, we conduct research into public health and welfare, and its related disciplinary areas. With the cooperation of active policy makers and personnel from the healthcare departments, the research results can be applied to the present healthcare policies and system. Through this education on collecting data, clarifying issues, analyzing the situation, and evaluating options, students taking this course are expected to grow in their ability to make healthcare policies.

Available programs:

Lecture and Conference 18:00-19:30 Monday
Special Lecture as occasion demands
Seminar as occasion demands

Practice

Goals/Outline:
We analyze and discuss the health and welfare policies proposed by the government based on the health statistic data and socio-economic indicators. The goals and objectives of us are to acquire the planning and evaluation skills etc. through these process.

Available programs:

Practice and Conference 20:00-21:00 Monday

Lab

Goals/Outline:
To discuss the problems in studies which handling by each student can appear us the best way to carry out the studies. The students present the contents of their studies in terns and focusing the problems in their studies. These processes shows the students for the best way to develop their studies.

Available programs:

Presentation and Conference 21:00-22:30 Monday

7. Grading System

PhD candidates are evaluated by the aggressiveness to the research subjects and the participation to the lecture and practice. In addition to this, the presentation number of times in the academic meetings.

8. Prerequisite Reading

The recent situation of medicine and related areas should be investigated through the following books, the internet, etc. including mass media information.

9. Reference Materials

① "Medical Care in Japan", Naoki Ikegami and J. C. Campbell (Chuokoron-Shinsha, Inc.)
② White papers from the Japanese Ministry of Health, Labour and Welfare
③ "National Health Trends 2013/2014" (Health, Labour and Welfare Statistics Association)
④ "Ministry of Health and Welfare: 50-year history"
⑤ "50 Years of Postwar Medical Care", Jiro Arioka (Japan Medical Journal)
⑥ "Public Policy Studies", Edited by Yukio Adachi and Toshimasa Moriwaki (Minerva Shobo)
⑦ "A Primer for Policy Analysis", Edith Stokey and Richard Zeckhauser (Keiso Shobo)

10. Important Course Requirements

None in particular

11. Availability in English

Available

12. Office Hours

Contact: Kazuo Kawahara, Policy Sciences Dept.; E-mail: kk.hcm@tmd.ac.jp

13. Note(s) to students

Not particular

Molecular Epidemiology

Lecture	(code:	7 1 2 1	1st year	:6units)
Practice	(code:	7 1 2 2	1st～2nd year	:4units)
Lab	(code:	7 1 2 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Masaaki Muramatsu E-mail muramatsu.epi@tmd.ac.jp

2. Classroom/Lab

Conference room of Molecular Epidemiology at 2nd Floor of Building 22 on Surugadai-campus.

3. Course Purpose and Outline

Learn how human genome research is applied to basic and clinical medicine.

4. Course Objective(s)

To understand how human genome information is related to human diseases.

5. Format

Lectures will be done in a small group (up to 10 person). Practice and lab will be taught in a one-on-one manner.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To understand genetic and environmental risk factors of common metabolic diseases such as hypertension, diabetes, metabolic syndrome, and atherosclerosis by employing human genomic approach to epidemiology. Gene-environment interaction and epigenetic changes, such as developmental origins of health and disease (DOHaD) that underlie these diseases will also be studied.

Available programs:

Lecture: Substituted by Seminar & Journal Club
Special Lecture: as-needed basis
Seminar & Journal Club: Every Wednesday morning 10 AM to 12AM

Practice

Goals/Outline:
To learn methods for genomic and statistical analysis by relevant computer software using template and actual data-sets,

Available programs:

genetic & statistical analysis course

Lab

Goals/Outline:
To learn how to genotype variations such as SNPs and repeat polymorphisms in the human genome.
To learn how to analyze epigenetic changes, such as DNA methylation and histone modification.

Available programs:

Lab works will be taught through attending to the internal projects.

7. Grading System

Grading will be done by the attendance and the presentation at the lab meeting.

8. Prerequisite Reading

Reading reference materials are recommended.

9. Reference Materials

Human Genome Epidemiology M.Khoury et al. (Oxford Press)
Personal Genomics and Personalized Medicine H.Bolouri (Imperial College Press)

10. Important Course Requirements

11. Availability in English

Available

12. Office Hour

Contact: Masaaki Muramatsu (muramatsu.epi@mri.tmd.ac.jp)

13. Note(s) to students

Research Development

Lecture	(code:	7 1 3 1	1st year	:6units)
Practice	(code:	7 1 3 2	1st～2nd year	:4units)
Lab	(code:	7 1 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor, Kozo Takase　E-mail:　ktakase.rdev@tmd.ac.jp

2. Classroom/Lab

Research Office, Department of Research Development, M&D Tower 16F

3. Course Purpose and Outline

Study on development of medical system and hospital management

4. Course Objective(s)

Obtaining capability of research and development on medicak management

5. Format

small class or seminar

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　The goals supposed in the lecture are mastering the technique of implementation of research development and acquiring the ability of management of projects.

Available programs:

Lecture　19:00-21:00,　every Thursday (April to December)
Special Lecture　as-needed

Practice

Goals/Outline:
　The aim in the practical program is developing the performance of implementation and management of projects.

Available programs:

Practical Conference　19:00-21:00,　every Tuesday

7. Grading System

evaluated from the point of view of disscussion in the class and reports

8. Prerequisite Reading

preparation for curriculum contents of MMA course

9. Reference Materials

informed in class

10. Important Course Requirements

nothing particular

11. Availability in English

none

12. Office Hour

send inquiries to ktakase.rdev@tmd.ac.jp

13. Note(s) to students

Candidates are supposed to be completed “Master of Medical Administration” course, Tokyo Medical and Dental University.

Health Policy and Informatics

Lecture	(code:	7 1 4 1	1st year	:6units)
Practice	(code:	7 1 4 2	1st～2nd year	:4units)
Lab	(code:	7 1 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Kiyohide Fushimi E-mail kfushimi.hci@tmd.ac.jp

2. Classroom/Lab

Research unit of Health Care Informatics Section

3. Course Purpose and Outline

To obtain the theory, applications and practical knowledge for handling medical information and database management.

4. Course Objective(s)

To understamd methodology for analysing case-mix health data and administrative data

5. Format

lecture and small group discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Methodology and application of data handling, data analysis, database management for health data and administrative data from hospitals and the government will be lectured. In addition, basics and application of patient case-mix system and DPC system will be lectured.

Available programs:

Lecture to be announced
Special Lecture to be announced
Seminar to be announced
Journal Club to be announced
Conference to be announced

Practice

Goals/Outline:
Practices of data analysis for large-scale health care data bases will be available

Available programs:

Research conference 19:00 - 21:00 on Fridays

Lab

Goals/Outline:
Data analysis using SQL and OPAP database

Available programs:

to be announced

7. Grading System

reports, conference presentation, etc.

8. Prerequisite Reading

Health system of Japan

9. Reference Materials

Health care assessment by health data' edited by Shinya Matsuda and Kiyohide Fushimi, University of Tokyo Press co.

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

10 am to 5 pm on weekdays by e-mail to kfushimi.hci@tmd.ac.jp

13. Note(s) to students

none

Life Sciences and Bioethics

Lecture	(code:	7 1 5 1	1st year	:6units)
Practice	(code:	7 1 5 2	1st～2nd year	:4units)
Lab	(code:	7 1 5 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Masayuki Yoshida, Professor E-mail masa.bec@tmd.ac.jp

2. Classroom/Lab

Schedule of Lectures and seminars will be annonced accordingly

3. Course Purpose and Outline

The purpose of this course is to engage researchers in learning and considering the responsible conduct of science.

4. Course Objective(s)

Learn how to prepare, submit, and discus research protcol forI RB and REC

5. Format

Our course will be consisted from no more than 5-6 students. It is highly recommended to actively participate in the debate and discussion.

6. Course Description and Timetable

Check with instructor for the program detail

Lecture

Goals/outline:
To learn the importance of ethical consideration based on specific study of three distinct area of the field; Medical Ethics, Research Ethics, and Bioethics.

Available programs:

Lecture to be announced
Special Lecture to be announced
Seminar to be announced

Practice

Goals/Outline:
To plan a research project with careful survey of background and previous observation. It is also important to learn a statistics required for medical research.

Available programs:

Journal Club to be announced

Lab

Goals/Outline:
It is necessary to directly conduct such a medical study with either basic or clinical research theme.

Available programs:

7. Grading System

Grading will be considered based on the participation and its outcome to Lectures, Practices, and Lab works.

8. Prerequisite Reading

Contact instructor

9. Reference Materials

Contact instructor

10. Important Course Requirements

Bioethics and CITI class on April 17 (FRI) are mandatory

11. Availability in English

Mandatory class described above(see 2.) will be given in English

12. Office Hour

0930-1700 (MON-FRI)

13. Note(s) to students

Not in particular.

Forensic Dentistry

Lecture	(code:	8 3 7 1	1st year	:6units)
Practice	(code:	8 3 7 2	1st～2nd year	:4units)
Lab	(code:	8 3 7 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor SAKURADA Koichi Assistant Professor UTSUNO Hajime

2. Classroom/Lab

Forensic dentistry office (M&D Tower 8F)

3. Course Purpose and Outline

The purpose of the course is to understand academic field of forensic dentistry and its connection with social life. In particular, by the establishment of two laws for cause of death investigation, in recent years the identification work by the dentist is regarded as important at a crime and a big disaster. Students learn those significant through case reports.

4. Course Objective(s)

By taking this course, students will;
1) learn the history of the forensic dentistry and be able to understand the social significance.
2) understand an academic field of the forensic dentistry and be able to draw up its research theme.
3) understand why dental findings are effective for personal identification, and can explain the connection with the other methods such as DNA typing.

5. Format

This course is small-group format. Students learn through a lecture and a case report.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

This is a course for learning about various personal identification methods in the forensic dentistry, including intraoral findings, the morphological characteristics of bones, face image analysis, DNA typing, and so on.

Available programs:

Lecture Nov.10 to Dec.22 Every Tuesdays 16:00 - 18:00

Practice

None

Available programs:

None

Lab

None

Available programs:

None

7. Grading System

Grading is performed comprehensively based on participation situation and learning attitude to programs.

8. Prerequisite Reading

Since an instructor gives you some instructions as necessary, please contact to him beforehand.

9. Reference Materials

Forensic Dental Medicine (6th ed., Katsuichi Yamamoto, Ishiyaku Publishers Inc.), New Essentials of Forensic Medicine (5th ed., Takehiko Takatori, Ishiyaku Publishers Inc.)

10. Important Course Requirements

Please note a leak of the personal information such as photographs to treat with a lecture document.

11. Availability in English

None

12. Office Hour

Contact person: Department of Forensic Dentistry, Koichi Sakurada, E-mail: sakurada.fde@tmd.ac.jp

13. Note(s) to students

None

Health Care Economics

Lecture	(code:	８３８１	1st year	:6units)
Practice	(code:	８３８２	1st～2nd year	:4units)
Lab	(code:	８３８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Koichi Kawabuchi,　Assistant Professor: Isao Igarashi
Part-time Lecturers: Shigeru Sugihara, Tomohiko Inui, Yukiko Ito,
Contact person: Isao Igarashi　　E-mail　igarashi.hce@tmd.ac.jp

2. Classroom/Lab

Office of Health Care Economics

3. Course Purpose and Outline

Core local hospitals in communities takes on the responsibility of supporting front-line healthcare in the nation. Faced with recent changes in healthcare and long-term care, they long for personnel competent in healthcare management. Call for such personnel is strong among research organizations and public offices as well, looking for those who are proficient in qualitative and quantitative analysis. Therefore, this course aims to train students to be capable in making immediate contribution to the healthcare and welfare field, and to educate future "academic doctors" who can voice their messages in policy making.

4. Course Objective(s)

To learn the framework of healthcare economics, and possibly achieve certain level in the Economics Record Examination by Japan Association of ERE

5. Format

Study of the following through lectures and research on specific case
・Research plan (Framework, Literature review, Strategies)
・Research design (Introduction, Purpose, Research questions and hypotheses, Use of theory, Terms and definitions, Research limitations and significance, Quantitative research)
・Paper structure (Title, Abstract, Introduction, Methods, Results, Discussion, References)
・Logistic thinking
・Others

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Understanding the methods of research on phenomena in health care field through economics point of view
The lecture will be centered around such topics as the approach to a research theme in economics and other social sciences (especially empirical studies) , how to proceed with the research, and paper writing

Available programs:

Lecture/ Seminar　Thursdays in May 14th through September 24th, 18:00-20:00
Special lectures (2015)　May 14th, 21st, 28th, and June 4th, 18:00-20:00

Practice

Designing and refining of each research plan through presentation and interactive discussion

Available programs:

Lecture/ Seminar Thursdays in May through September, 18:00-20:00

Lab

Obtain health care economics points of view and master its research methods relevant to individual themes, and proceed to practice writing papers that will be accepted to academic journals

Available programs:

Time and place will be announced and notified

7. Grading System

Will be based on overall achievement including attendance and contributions in lectures and other occasions. Research quality, and the degree of participation in outside opportunities such as presentation at academic conferences will also be reflected in grades

8. Prerequisite Reading

Koichi Kawabuchi "'Mieruka' Iryokeizaigaku Nyumon" ("Introduction to 'Visualized' Healthcare Economics", in Japanese only), Ishiyaku Publishers Inc. Participation in special lectures featured by our office as well as to courses in Basic-Clinical Borderless Education is recommended

9. Reference Materials

・S. B. Merriam and E. L. Simpson "A Guide to Research for Educators and Trainers of Adults" 2nd ed. (Updated), Krieger Publishing, 2000. (Translation in Japanese also available)
・J.W. Creswell "Research design: Qualitative, quantitative, and mixed method approaches" 2nd ed., Sage, 2003. (Translation in Japanese also available)
・Tuyoshi Kawasaki "Shakaikagakukei notameno 'Yushuronbun' Sakuseijyutu Puronogakujyuturonbun kara Soturonmade" ("Techniques of Writing 'Excellent Papers' in Social Science from Professional Academic Papers to Graduation Thesis, in Japanese) Keiso Shobo Publishing Co., Ltd., 2010.
・S. Folland, A.C. Goodman, M. Stano "The Economics of Health and Health Care" Prentice Hall.
・J.M. Wooldridge "Introductory Econometrics; A Modern Approach" South-Western Pub.

10. Important Course Requirements

None

11. Availability in English

Available(on request)

12. Office Hour

Contact Igarashi (igarashi.hce@tmd.ac.jp) for appointment

13. Note(s) to students

Plans to schedule intensive lectures by part-time lectures on basic statistics, microeconomics, and health care economics as applied microeconomics. Audits are welcomed.

Dental Education Development

Lecture	(code:	８３９１	1st year	:6units)
Practice	(code:	８３９２	1st～2nd year	:4units)
Lab	(code:	８３９３	2nd～3rd year	:8units)

1. Instructor(s)

Ikuko MORIO (Professor), Naoko SEKI (Assistant Professor)
Contact person: Ikuko MORIO　E-mail: imorio.edev@tmd.ac.jp

2. Classroom/Lab

Seminar Room of Dental Education Development (M&D Tower 7F north-side, N-717)

3. Course Purpose and Outline

To help students understand the basics of assessment in the healthcare professions education

4. Course Objective(s)

The students explain the basic elements of assessment in the healthcare professions education

5. Format

Combination of mini-lectures and practice in small groups

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline:
To understand the educational contents and the learning strategies required for fostering health care professionals who are capable of comprehensive patient care, team approach, and community-based care. The course will cover health care professional education ranging from the undergraduate level to life-long learning, focusing on integration of medicine and dentistry.

Available programs:

Lecture　Nov. 6 to Dec. 11　Friday 15:00-17:00
*Please check with the instructor on the dates by email beforehand.

Practice

Goals/Outline:
To experience the process of curriculum planning: to grasp needs/demands; to set educational goals/objectives; to select and evaluate learning strategies and evaluation methods.

Available programs:

Lecture/practice　Friday 15:00-17:00 (starting in November)
*Please check with the instructor on the dates by email beforehand.

Lab

Goals/Outline:
To find issues surrounding dental workforce education, collect appropriate data, sort them out and discuss possible solutions based on the results of analysis.

Available programs:

All the research activities within the section

7. Grading System

Combination of participation in discussion/practice/research. As for Lab activities, research contents, participation in related research and meetings, presentations at scientific meetings are also considered.

8. Prerequisite Reading

designated parts in the textbook

9. Reference Materials

ISBN:9780805861280 Assessment in Health Professions Education Edited by Steven M. Downing, Rachel Yudkowsky, Routledge

10. Important Course Requirements

submission of assignments by deadline

11. Availability in English

Available

12. Office Hour

Friday, 17:00-19:00 Ikuko MORIO (imorio.edev@tmd.ac.jp)

13. Note(s) to students

None

Oral Health Promotion

Lecture	(code:	８４０１	1st year	:6units)
Practice	(code:	８４０２	1st～2nd year	:4units)
Lab	(code:	８４０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Yoko Kawaguchi　　Associate Professor Masayuki Ueno　　Assistant Professor Takashi Zaitsu

2. Classroom/Lab

To be announced depending on the programs by course instructors

3. Course Purpose and Outline

The purposel of the course is to foster dental health professionals who can appropriately deal with the change of trend and environment in dentistry, analyze and solve environmental, social and economic problems related to oral health, and practice and develop oral health promotion at individual and community levels.

4. Course Objective(s)

By taking these courses, students will be able to;
a. Create a proposal for an oral health promotion program or research at individual and community levels using techniques discussed in these courses.
b. Plan an oral health promotion program or research by applying social and behavioral theories and techniques.
c. Develop goals, measurable objectives, and effective intervention strategies for an oral health promotion program or research.
d. Implement an oral health promotion program or research in the actual field of public health.
e. Design an evaluation plan using appropriate measurement tools, evaluation approaches, and evaluation designs.
f. Apply appropriate data analytic methods to report the results of an oral health promotion program or research.
g. Identify and explain the strengths and limitations of an oral health promotion program or research.
h. Make necessary changes and improvements to an oral health promotion program or research.

5. Format

Small-group format

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
One of the goals of the course is to foster dental health professionals who can appropriately deal with the change of trend and environment in dentistry, analyze and solve environmental, social and economic problems related to oral health, and practice and develop oral health promotion at individual and community levels. Specific topics include prevention of oral diseases, clinical practices of dental public health, basic principles and methods of oral epidemiology, social aspect of oral diseases, primary health care and health promotion in various settings, and oral health promotion within the context of health care and education system. Another goal is to teach and discuss oral health issues and problems in the world. The topics include comparison of oral health care services, oral health status, and dental education in various countries from a global perspective. The principles and methods for international cooperative activities in the field of dentistry are also introduced.
The course consists of didactic lectures, case presentations and discussion sessions.

Available programs:

Lecture　Nov. 10 to Dec. 1　Every Tuesdays　15:00 - 17:00
Special Lecture　as needed
Seminar　as needed
Journal Club　as needed

Practice

Goals/Outline:
Field work is an opportunity to apply key concepts of planning, strategies and evaluation methods, which are essential for developing and practicing oral health promotion and prevention programs at individual and community levels, and analyze actual cases.

Available programs:

Case presentation seminars　as needed
Field research and activities　as needed

Lab

Goals/Outline:
Implement an intervention program in the field of maternal health, school health, industrial health or adult/elderly health, and conduct analysis and evaluation on the effects of the intervention program.

Available programs:
Conference on intervention programs　as needed

7. Grading System

The grading will be made based on the lectures, course participation and research content.
In addition, the degree of paricipation in research and study meeting, number of conference participation will be considered for comprehensive evaluartion.

8. Prerequisite Reading

Before taking these courses, students are expected to have a wide range of knowledge not only on natural science but also on social science and humanities.

9. Reference Materials

Oral Health Promotion (Lone Schou and Anthony Blinkhorn) Oxford Medical Publications
Asian Perspectives and Evidence on Health Promotion and Education (Takashi Muto et al.) Springer

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Contact person: Department of Oral Health Promotion, Masayuki Ueno, Mon & Thu 16:00-18:00, E-mail ueno.ohp@tmd.ac.jp

13. Note(s) to students

None

Sports Medicine and Dentistry

Lecture	(code: 8411	1st year	:6units)
Practice	(code: 8412	1st～2nd year	:4units)
Lab	(code: 8413	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor Toshiaki UENO
Assistant Professor Toshiyuki TAKAHASHI・Hiroshi CHUREI
Contact person: Hiroshi CHUREI E-mail chu.spmd@tmd.ac.jp

2. Classroom/Lab

Because classroon and venues are different from each of the following program, please confirm the venue in advance to contact person. Our labs and offices are located at 3rd and 4th floor of the building 10.

3. Course Purpose and Outline

Purpose and outline of this course is to provide essential knowledge and experimantal technique to understand and research sports medicine and dentistry through the lecture, practice and lab works described bellow.

4. Course Objective(s)

・To understand oral health management for athletes and sports-loved people, To understand the diagnosis, treatment procedure and safety measure of sports-related oral and maxillofacial injury, To understand the relationship between oral function and general motor function.

5. Format

Lectures and small-group discussions in will be performed.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The following topics on sports medicine/dentistry will be lectured: 1. Maintenance and improvement of individual's health by various sporting activities and recreations; 2. Diagnosis, treatment and prevention of sports injury and disorders; 3. Improvement and optimization of athletic performance on the basis of exercise physiological and kinesiological studies.

Available programs:

Lecture November to December (Monday 17:00-19:00)
Special Lecture As needed (2 times/yr)
SPMD Seminar As needed (1-2 times/yr)

Practice

Goals/Outline:
Trends and controversial points in recent researches for sports medicine/dentistry will de discussed through participation and presentation in Journal Club. Clinical skills and knowledge of diagnosis, treatment and prevention will be studied through participation in Clinical Conference.

Available programs:

Journal Club every Wednesday 17:30-18:30
Clinical Conference As needed

Lab

Goals/Outline:
Handlings of experimental devices for sport medicine/dentistry study and collection and analysis of data will be practically trained through participation in research group in SPMD Lab.

Available programs:

Participation in Research Group of SPMD Lab　As needed

7. Grading System

Grading is performed comprehensively based on participation situation and learning attitude to programs.

8. Prerequisite Reading

None

9. Reference Materials

Sports dentistry (Dental North Clinics of North America) , Advances in Sports dentistry (Dental North Clinics of North America) , Textbook and Color Atlas of Traumatic Injuries to the Teeth (Willy-Blackwell), Oxford Textbook of Sports Medicine (Oxford University Press)

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Monday and Thursday 16:00-17:00

13. Note(s) to students

None

Educational System in Dentistry

Lecture	(code: ８４２１	1st year	:6units)
Practice	(code: ８４２２	1st～2nd year	:4units)
Lab	(code: ８４２３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Kouji ARAKI
Junior Associate Professor(non-full time) Yukio NAKAMURA Hiroki KATAOKA

2. Classroom/Lab

Confirm it to the instructor in a different place by a program beforehand.

3. Course Purpose and Outline

The aim of the lecture is to understand the purpose and method about the evaluation of dental education system. In addition, it is to understand the level and inspection method of international dental education . The aim of the practice is to understand a method of data analysis provided by the evaluation.system for the dental education, In addition, it is to understand the comparison with the international education level The aim of the Lab is to manage the teaching materials developed for simulation education and is to understand the inspection method of the evaluation for new education system.

4. Course Objective(s)

1) You can explain various evaluation method for the dental education.
2) You can explain the international level in each undergraduate and postgraduate of dental education.
3) You can explain the construction method of the dental education system.
4) You can explain the dental education using simulation devices.
5) You can practice the simulation devices for the dental education.
6) You can practice the data analysis of the evaluation for the dental education..

5. Format

The instructor performs guidance for students to help teaching self-study, problem discovery, and development of the problem solving ability. In the practice, students can perform experience training using equipment developed for simulation education.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Main object of educational system in dentistry in the graduate course is to provide opportunity
to study evaluation method for dental education curriculum, inspection method of the validity and reliability of the evaluation system for dental education, evaluation system compared between international and Japanese education level in undergraduate or after the graduation periods, and dental clinical skills improvement by the virtual reality simulation system.

Available programs:

Lecture 5/18,5/25,6/1,6/8,6/15,6/22,6/29,7/13 (every Monday 17:00～19:00)
Special Lecture It will carry out in twice from 17:00 to 19:00, February, 2016 (date undecided)

Practice

Goals/Outline:
Students participate in data analysis and the comparison with an international educational level evaluation system.

Available programs:

Data analysis about the evaluation for dental education system from September to October (every Thursday from 16:00 to 18:00)
Comparison with the evaluation system for the level of international education from November to December (every Thursday from 16:00 to 18:00)

Lab

Goals/Outline:
Students participate in research of the evaluation method of a new educational system while experiencing the teaching materials and system developed for simulation education.

Available programs:

Study of the education system evaluation using the dentistry education simulation system from September to December (in total ten times for once two hours, on the day, not to arrange)

7. Grading System

Instructor generally evaluates it based on a lecture, practice, lab, the participation situation to the experiment and an action. In addition, Instructor performs a general evaluation based on degree of report contents, various studies and the participation in study meeting, the number of times of the presentation at the meeting.

8. Prerequisite Reading

1) Instructor recommends that you read beforehand about the following reference book.
2) Instructor recommends that the graduate student of the dentist will use to a dental education simulation system.

9. Reference Materials

＊Everything is a Japanese textbook.
1)高橋優三:新医学教育あれこれ 能動教育の推進に役立つ実務資料集. 三恵社. 2011.
2)千代豪昭、黒田研二 編集:学生のための医療概論 第3版. 医学書院. 2010.
3)J. A. Dent、R. M. Harden(著)鈴木康之、錦織 宏(監訳):医学教育の理論と実践. 篠原出版. 2010.
4)日本テスト学会(編):テスト・スタンダード. 金子書房. 2007.
5)P. Schwartz、S.Mennin、G. Webb(編集)大西弘高(監訳):PBL 世界の大学での小グループ問題基盤型カリキュラム導入の経験に学ぶ. 篠原出版社. 2007.

10. Important Course Requirements

It needs the attendance of all lectures, but when you take a rest for a reason not to be able to bear to stop, instructor will give you the problem of the report.

11. Availability in English

The class in the English is possible depending on hope.

12. Office Hour

Contact person: Center for Education Research of Medicine and Dentistry, Professor Kouji ARAKI
E-mail k.araki.gend@tmd.ac.jp
You do not arrange the time in particular on a day, but contact me beforehand by all means.

13. Note(s) to students

There is not the number of people restrictions in lecture.
As a general rule, the number of participate in the practice and Lab can assume it less than ten.

Educational Media Development

Lecture	(code:	8 4 3 1	1st year	:6units)
Practice	(code:	8 4 3 2	1st～2nd year	:4units)
Lab	(code:	8 4 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor Atsuhiro Kinoshita E-mail kinoshita.emdv@tmd.ac.jp

2. Classroom/Lab

Information Retrieval Room in University Library, Faculty Room of Department of Educational Media Development, or Demonstration Room on 5th floor in Building 7.

3. Course Purpose and Outline

This course will provide students with an overview of current educational media in health science professionals utilizing information and communication technologies (ICT).
Each student must create and present original educational materials in this course.

4. Course Objective(s)

To understand the characteristics of current educational systems and educational media utilizing ICT.
To learn how to create and apply original educational materials.
To perform and report a study on development, application, or evaluation of new educational media.

5. Format

Small-group format.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The goals of the course are to understand the characteristics of current educational systems and educational media utilizing information and communication technologies, such as computer assisted simulation systems, e-learning systems, and live broadcasting systems, and to learn how to create original educational materials, and to master the way to apply them on the education for health science professionals.

Available programs:

Review meeting for the new teaching materials: 18:00 - 20:00 on every second Tuesday.

Practice

Goals/outline:
The goal of the practice is to create a new original teaching material utilizing information and communication technologies, such as computer assisted simulation systems, and e-learning systems.

Available programs:

Practice for creating new teaching material as necessary

Lab

Goals/outline:
The goals of the lab are to develop a new original teaching material or an educational system utilizing information and communication technologies, to apply it on the education for health science professionals, to evaluate its educational effects, and to present the results of the study.

Available programs:

Research meeting as necessary

7. Grading System

Comprehensive evaluation based on the original teaching materials, or academic presentation.

8. Prerequisite Reading

Student should experience sample materials of computer assisted simulation for medical and dental practice training on the website (http://www.tmd.ac.jp/dent/program/tmd04/page04.html).
Student should read documents on the WebClass course, and follow as instructed.

9. Reference Materials

TMDU Clinical Training Series – for ESL Dentists –, Kinoshita A, et al., Developer: Tokyo Medical and Dental University (TMDU), Publisher: University of Tokyo Press, 2012.

10. Important Course Requirements

Nothing in particular

11. Availability in English

Available(on request)

12. Office Hour

Atsuhiro Kinoshita
email: kinoshita.emdv@tmd.ac.jp

13. Note(s) to students

none.

Insured Medical Care Management

Lecture	(code:	７９４１	1st year	:6units)
Practice	(code:	７９４２	1st～2nd year	:4units)
Lab	(code:	７９４３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Masumi Ai　　E-mail　ai.vasc@tmd.ac.jp

2. Classroom/Lab

To be announced

3. Course Purpose and Outline

The purpose of this course is to understand the concepts and the structure of social medical insurance and its problems. Also seeking the solutions or improvement measures for the problems especially for its operation and/or manegement.

4. Course Objective(s)

The objective is to understand the overview of the social medical insurance and its problems, and to seek the solution for them through the analyses of the social background and other factors.

5. Format

Lecture and small group discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To learn the structure and the implementation details of the social insurance system for medical care in Japan.

Available programs:
Lecture:　To be announced (held with a hospital conference mostly in Japanese only: several days in the mid-month, every month)
Special Lecture:　To be announced
Seminar:　To be announced

Practice

Goals/outline:
To investigate and discuss on the problems on the health insurance system.

Available programs:

Seminar:　To be annouced

Lab

Goals/outline:
To plan and conduct a research project on social insurance system, including data collection and analyses.

Available programs:

To be announced

7. Grading System

Will be considered based on the participation and its outcome to Lecture, Practices, and Lab works. Paticipation for the research meeting and submitting reports are mandatory. The submission of reports on an individual thesis based on clinical experience of the applicant is also required during the period.

8. Prerequisite Reading

Being familiar with the medical terminology. A working experience as a medical staff or medical system office personnel is necessary.

9. Reference Materials

No reference materials written in English. There are some reference materials in Japanese.

10. Important Course Requirements

It is strictly prohibited to bring data to off-campus. The handling of personal information must be careful. Do not allow the course if there is a problem with the observance of confidentiality.

11. Availability in English

Partially available, most of the lectures and reference materials are Japanese only

12. Office Hour

8:30～17:15 Mon-Fri

13. Note(s) to students

Not in particular.

Geriatrics and Vascular Medicine

Lecture	(code: 7161	1st year	:6units)
Practice	(code: 7162	1st～2nd year	:4units)
Lab	(code: 7163	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kentaro Shimokado,
Associate Professor: Shohei Shinozaki

2. Classroom/Lab

To be announced

3. Course Purpose and Outline

The purpose of our reserch is to clarify the pathogenesis of areteriosclerosis, one of the major processes of aging of the human body, and find new drugs and modification of the life style. Studentss learn anatomy, physiology, vasrious cellular and molecular mechanisms that maintain integrity of the vascular system.

4. Course Objective(s)

(1) To understand basic structure and function of the vascular system. (2) To understand the molecular basis for fucntional regulation of the vascular cells. (3) To understand cellura and molecular pathogenesis of arteriosclerosis.

5. Format

Lectures are given in a small group. Laboratory work is personalized.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline
The goal is to understand various mechanisms involved in the maintenance of functional integrity of the vascular system, and vascular diseases as consequences of failure of these mechanisms. The vascular system is an intelligent network delivering materials, cells and information to various organs and tissues. The delivery is tightly regulated by mechanisms such as ligand-receptor systems, NO, adhesion molecules expressed on the vascular endothelium. Physical and functional damage to the vascular system is repaired by an inflammatory process including macrophages, cytokines/growth factors and myofibroblasts. Aging and inappropriate life styles cause malfunction of these regulatory mechanisms and repairing process, and end up vascular diseases.

Available programs:

Lecture: as required
Special Lecture: as required
Seminar: as required
Journal Club: Friday 12:00-13:00

Practice

Goals /outline
By conducting research under a supervisor, students will obtain knowledge and skills of asking appropriate scientific questions, planning a series of experiments to answer the question, and conducting actual experiments using various experimental techniques.
Students also learn how to present his/her data at scientific meetings and how to write scientific papers.

Available programs:

Mechanisms for the development of atherosclerosis, coronary risk factors, postprandial hyperlipidemia, cell therapy for peripheral artery diseases, SMP-30 and aging,

Lab

Goals /outline
By conducting research under a supervisor, students will obtain knowledge and skills of asking appropriate scientific questions, planning a series of experiments to answer the question, and conducting actual experiments using various experimental techniques.
Students also learn how to present his/her data at scientific meetings and how to write scientific papers.

Available programs:

Mechanisms for the development of atherosclerosis, coronary risk factors, postprandial hyperlipidemia, cell therapy for peripheral artery diseases, SMP-30 and aging,

7. Grading System

Progress reports and the final research paper

8. Prerequisite Reading

none

9. Reference Materials

none

10. Important Course Requirements

Knowledge of anatomy,physiology, molecular biolgy and clinical medicine of undergraduate level.

11. Availability in English

none

12. Office Hour

flextime

13. Note(s) to students

none

Rehabilitation Medicine

Lecture	(code: 7171	1st year	:6units)
Practice	(code: 7172	1st～2nd year	:4units)
Lab	(code: 7173	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Sadao MORITA E-mail morita.reh@tmd.ac.jp

2. Classroom/Lab

Rehabilitation training room

3. Course Purpose and Outline

Rehabilitation medicine consists of physical, occupational and speech therapy. Main theme of rehabilitation medicine in graduate course is to study 3-dimentional motion analysis in activities of daily living and molecular biological analysis of disuse atrophy.

4. Course Objective(s)

To understand the evaluation methods of activities of daily living, and to use them for the clinical practice.

5. Format

Small classes

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Rehabilitation medicine, physical, occupational and speech therapy.
The method of 3-dimentional motion analysis in activities of daily living.

Available programs:

Lecture The lecture is held on biweekly Monday, 17:30-18:30.
Special Lecture As occasion demands
Seminar Tuesday 17:30-20:00
Journal Club Monday 13:00-15:00
Conference Tuesday 8:30-9:00

Practice

To understand the evaluation methods of activities of daily living, and to use them for the clinical practice. The ability to judge the fitting of limb prosthesis.

Available programs:

Prosthesis Clinic / Every Tuesday

Lab

Goals/Outline:
The 3-dementional motion analysis of gait and upper limb movement in activities of daily living. The 3-dementional measurement of amputation stump for good fitting of artificial limb socket.

Available programs:

Prosthesis Clinic / Every Tuesday or any time

7. Grading System

Evaluation of understanding degree of the lecture.
Evaluation of the participation in the discussion, argument and experiment practice

8. Prerequisite Reading

Basis knowledge of physical, occupational and speeche therapy should be aquired.

9. Reference Materials

Randall L. Braddom. Physical Medicine & Rehabilitaion. Elsevier, 2011.
Yonemoto K. Saishin Rehabilitation Medicine. Ishiyakushuppan, 2005.

10. Important Course Requirements

N/A

11. Availability in English

None

12. Office Hour

9:00-17:00 Morita S. E-mail morita.reh@tmd.ac.jp

13. Note(s) to students

Gerodontology and Oral Rehabilitation

Lecture	(code:	８４４１	1st year	:6units)
Practice	(code:	８４４２	1st～2nd year	:4units)
Lab	(code:	８４４３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Shunsuke: MINAKUCHI Associate Professor Tsuneto OWATARI, Haruka TOHARA
Assistant Professor: Tatsuro UCHIDA, Norihisa AKIBA, Manabu KANAZAWA, Yusuke SATO,
Mai OKUBO, Yuriko KOMAGAMINE
Contact person: Shunsuke: MINAKUCHI, E-mail s.minakuchi.gerd@tmd.ac.jp

2. Classroom/Lab

Differs depending on program; check with instructor before attending.

3. Course Purpose and Outline

Basic targets of study of this field are prevention and recovery of the oral function(mastication, swallowing and phonetic function) declining with aging.

4. Course Objective(s)

Understanding dental approach to make the oral function of the elderly convalescent.
Understanding the role of the dental treatment in old society.
Understanding the influence by which a occlusal reconstruction by prosthodontic treatment by dntures gives the body function.

5. Format

Small class size designated.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　The basic objective of research in this field is the prevention and restoration of decreased oral functions accompanying aging. Lectures are given in follow areas.
　1) Dental approaches for restoring oral cavity functions in the elderly
　2) Research relating to the role of dental treatment in an aging society
　3)　Functional and psychological problems of edentulous patients and complete denture treatment.

Available programs:

Lecture　Friday 18:00-20:00
Special Lecture Arranged (scheduled for 3-4 sessions/year)
Seminar　Arranged
Journal Club Monday 17:00-18:00

Practice

Goals/Outline:
　Practice of actual dental treatment (including monitoring) on elderly individuals and fabricating complete dentures, taking impression, jaw relation records and aftercare for acquisition of skills.

Available programs:

Participation in areas of study and research at hospitals and other university-external facilities
Seminar on holistic care (Arranged)

Lab

Goals/Outline:
A physical action produces aging change. Oral functions, such as mastication, tongue movement, and lips closing present functional decline with aging. We have to understand these an elderly patient's change, and have to develop and master the effective technique about evaluating a masticatory function, body activity and central function, and recovery technique by removable dentures.

Available programs:

Dysphagia rehabilitation, evaluating the medical risk of geriatric dental patients, evaluation of masticatory functions, complete denture CAD/CAM, denture materials, implant over denture

7. Grading System

Participation in class, seminar and practice will be graded comprehensively. In Lab, grading will be done based on contribution for the study group, reports and presentation at academic meetings.

8. Prerequisite Reading

None

9. Reference Materials

Boucher's Prosthetic treatment for edentulous patients　Groher M E Dysphagia Diagnosis and Management
Peter E. Dawson :Dawson Functional Occlusion,

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Shunsuke: MINAKUCHI　s.minakuchi.gerd@tmd.ac.jp　Tsuneto OWATARI　t.owatari.gerd@tmd.ac.jp

13. Note(s) to students

In principle, class size is not limited.

Laboratory Medicine

Lecture	(code:	7 1 8 1	1st year	:6units)
Practice	(code:	7 1 8 2	1st～2nd year	:4units)
Lab	(code:	7 1 8 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Shuji Tohda　　E-mail　tohda.mlab@tmd.ac.jp

2. Classroom/Lab

Should be announced

3. Course Purpose and Outline

To develop the ability of clinical reasoning based on laboratory data.

4. Course Objective(s)

To understand the significance of laboratory tests　in clinical practice.　To interpret the findings of cells on blood and bone marrow smears.

5. Format

A small group tutorial

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　The application of laboratory medicine for the clinical medicine will be discussed.

Available programs:

Lecture　every Tuesday 10-11 AM

Practice

Goals/Outline:
　To discuss the significance of novel molecular tests.

Available programs:

Conference　every Tuesday 11-12 AM

Lab

Goals/Outline:
　Practice of hematological analysis based on the peripheral blood smears and bone marrow aspirated smears.

Available programs:

Lab Wednesday afternoon in Dec. through Feb.

7. Grading System

Interview will be used for grading.

8. Prerequisite Reading

To read the textbook below.

9. Reference Materials

Wintrobe's Atlas of Clinical Hematology, Lippincott Williams & Wilkins Inc.

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Contact person: Shuji Tohda E-mail tohda.mlab@tmd.ac.jp

13. Note(s) to students

Any question will be answered by the contact person.

Intensive Care Medicine

Lecture	(code:	７１９１	1st year	:6units)
Practice	(code:	７１９２	1st～2nd year	:4units)
Lab	(code:	７１９３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Kouichi Nakazawa　　E-mail　nakazawa.mane@tmd.ac.jp

2. Classroom/Lab

Please ask instructor before attending a lecture, because it depends on the program.

3. Course Purpose and Outline

To widen recent knowledge about　acute respiratory distress syndrome and septic shock.

4. Course Objective(s)

To understand mechanisms and treatment of acute respiratory distress syndrome (ARDS) and septic shock.

5. Format

A small class. We discuss about our research as much as possible to interact each other.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
ARDS and septic shock are critical illnesses and mortality is high. Our goals are to elucidate mechanisms of ARDS and septic shock and develop strategy for treatment of ARDS and septic shock.

Available programs:

Lecture　(Every Thursday 16:00-17:00)
Special Lecture (June, November)
Journal club (Every Friday)

Practice

Goals/Outline:
　To study mechanisms of ARDS and septic shock.

Available programs:

Research seminar (Department of Anesthesiology, Department of Critical Care Medicine), Third Saturday of every month 10:00 - 11:00
Round of ICU (every day 8:30 - 9:30)

Lab

Goals/Outline:
　To elucidate the mechanism of ARDS and septic shock and develop a new treatment and prevention of ARDS and septic shock.

Available programs:

Experiment of ARDS model, 1/month, 12:00 - 17:00
1) Method of tracheostomy (rabbit)
2) Mechanical ventilation (rabbit)
3) Insertion of cannula into artery and vein (rabbit)
4) Lung perfusin model (mouse)

Experiment of cecal ligation puncture rat model, 1/month,12:00-17:00

7. Grading System

General assessment which is based on attendance rate and research content.
1) attendance rate (lecture, seminar, practice): 80%
2) presentation at academic conference and publication of research: 20%

8. Prerequisite Reading

Dellinger RP, et al. Surviving sepsis campaign: International guidelines for management of severe sepsis and septic shock:2012

9. Reference Materials

Endotoxemia and endotosin shock, disease, diagnosis and therapy, Editors: Ronco C, Piccinni P, Rosner MH, Contributions Nephrology, Vol.167, 2010KARGAR,

10. Important Course Requirements

Habits of punctuality

11. Availability in English

Available

12. Office Hour

8:30-17:00

13. Note(s) to students

Although there is no limit of number of people, we prefer within 10 people in conference and class presentation.

Liaison Psychiatry and Palliative Medicine

Lecture	(code:	７２０１	1st year	:6units)
Practice	(code:	７２０２	1st～2nd year	:4units)
Lab	(code:	７２０３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Prof. Eisuke Matsushima　　E-mail: em.lppm@tmd.ac.jp

2. Classroom/Lab

Contact us for information.

3. Course Purpose and Outline

Understand the psychosocial issues in the general medical settings from a viewpoint of comprehensive medicine

4. Course Objective(s)

Develop skills to provide a comprehensive diagnosis, treatment and prevention of psychosomatic problems in physical illness

5. Format

Class sizes are kept small to facilitate student-teacher interaction and class discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline:
The lectures would cover the broad area of consultation-liaison psychiatry including;
・Psychological problems and psychiatric symptoms in the general medical settings
・Palliative care for patients with cancer

Available programs:

Lecture　generally Thursday 13:00-15:00
Special Lecture　generally Thursday 15:00-17:00
Seminar　generally Thursday 10:00-12:00
Journal Club　biweekly Thursday 17:30-19:00

Practice

Goals/Outline:
・Develop new methods for diagnosis, treatment and prevention of psychosomatic problem through case discussions
・Learn and practice skills to develop assessments and design appropriate treatment plans for patients with various psychiatric disorders

Available programs:

Lab

Goals/Outline:
・Our research projects are;
・Intervention study on physically ill patients with psychiatric problem
・Clinical-physiological research on psychiatric patients
・Acquire up-to-date knowledge of scientific findings and practice specialized research techniques for these area
・Apply these knowledge and techniques for further development of current research

Available programs:

7. Grading System

Grades will be based on participation, research work, presentation at academic conference and research paper publications.

8. Prerequisite Reading

Students are expected to preview the books on the required reading list.

9. Reference Materials

・精神腫瘍学クリニカルエッセンス　日本総合病院精神医学会がん対策委員会　監修　小川朝生　編集　創造出版
・コンサルテーション・リエゾン精神医学ガイド　松浦雅人　監訳　メディカル・サイエンス・インターナショナル
・精神腫瘍学　内富庸介　小川朝生　編集　医学書院
・臨床精神医学講座17　リエゾン精神医学・精神科救急医療　松下正明　総編集　中山書店
Please contact us for English textbooks.

10. Important Course Requirements

N/A

11. Availability in English

Some activities are available in English. Contact us for more information.

12. Office Hour

Contact person: Prof. Eisuke Matsushima　　E-mail: em.lppm@tmd.ac.jp

13. Note(s) to students

Journal club and case discussion will have less than 20 participants.

Pharmacokinetics and Pharmacodynamics

Lecture	(code: 7211	1st year	:6units)
Practice	(code: 7212	1st～2nd year	:4units)
Lab	(code: 7213	2nd～3rd year	:8units)

1. Instructor(s)

Professor Masato Yasuhara, Associate Professor Masashi Nagata
Contact person: Prof. Masato Yasuhara E-mail yasuhara.mpha@tmd.ac.jp

2. Classroom/Lab

To be asked to the instructor before registration.

3. Course Purpose and Outline

In order to understand the kinetics of drug action comprehensively, the updated knowledge about pharmacokinetics and pharmacodynamics will be lectured from the standpoint of interaction between drug molecules and the organ in the body.

4. Course Objective(s)

To predict the kinetics of drug action and to evaluate the drug-drug interactions, based on the mechanisms of drug abosorption, distribution, metabolism and excretion

5. Format

The course is a small class and will have a discussion chance with registrants.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
An outline of the drug transport across the biomembrane and the drug disposition in the cell, organ and whole body will be reviewed and the recent advances on the effects of disease states and concurrent drugs on the pharmacokinetics of drugs will be discussed. In addition, the kinetic aspect of pharmacokinetic and pharmacodynamic analysis will be lectured.

Available programs:

Lecture Tuesday 18:00-19:30
Special Lecture TBA
Pharmacy Seminar Monday 18:30～19:30

Practice

Goals/Outline:
Recent literatures on the absorption, distribution, metabolism and excretion (pharmacokinetics) of drugs and related fields will be introduced and discussed. The practice of pharmacokinetic analysis based on the population approach or Bayesian method will be conducted.

Available programs:

Laboratory conference Thursday 18:00～19:00

Lab

Goals/Outline:
Fundamental experimental techniques such as drug concentration measurement, drug effect evaluation and kinetic analysis will be practiced and applied to the development of the individual dosage adjustment based on the drug concentration monitoring for individual patients.

Available programs:

Join the research program TBA

7. Grading System

The degree of participation to the lecture, practice and laboratory work, as well as the presentation and comments in the course will be reviewed. In addition, the research content and the number of presentations at the academic meetings will be evaluated comprehensively.

8. Prerequisite Reading

Proficiency in basic pharmacokinetics, such as moment analysis and compartment model.

9. Reference Materials

Clinical Pharmacokinetics and Pharmacodynamics: Concepts and Applications, 4th ed., Lippincott Williams & Wilkins (2011)

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Ask to Dr. Yasuhara by e-mail: yasuhara.mpha@tmd.ac.jp

13. Note(s) to students

The number of participants to the Pharmacy Seminar is limited to 10.

Medical Education Research and Development

Lecture	(code:	7 2 2 1	1st year	:6units)
Practice	(code:	7 2 2 2	1st～2nd year	:4units)
Lab	(code:	7 2 2 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor Yujiro TANAKA　Junior Associate Professor Makoto TAKAHASHI
Related Departments:
Pathogenesis and Pathophysiology Professor Yuki SUMI
Professional Development Center Junior Associate Professor Yasuhiro ITSUI Junior Associate Professor Toshifumi KUDO
General Medicine Junior Associate Professor Eriko OKADA
Medical Welfare and Liaison Services Center Junior Associate Professor Hajime IZUMIYAMA
Contact person: Makoto TAKAHASHI　E-mail takahashi.merd@tmd.ac.jp

2. Classroom/Lab

Seminar Room (N-1601)

3. Course Purpose and Outline

To learn theory and the methods of the latest medical education and try to present the solutions for problems about clinical education.

4. Course Objective(s)

・Analyze medical and/or social issues about medical education.
・Understand theory and practice of medical education.
・Conduct research of medical education.

5. Format

Small-group class

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
We address many problems about clinical education and discuss several approaches to their solutions. These problems have not yet been given a theoretical framework in order to examine various social elements closely related to them. Our aim is to construct an educational theory that can deal with practical difficulties and to propose possible solutions.

Available programs:

Seminar & Journal Club: 11:40-13:00 on every Friday
MMA Lecture: "Development and Utilization of Medical Experts"/"Leadership in the Medical Institution"

Practice

Goals/Outline:
We pick out a problem based on a real case, consider a solution based on any applicable theory, and simulate for evaluation methods for the proposed solution.

Available programs:

Conference　TBA

Lab

Goals/Outline:
Students are expected to master skills necessary for research and development of the medical education by participating in a research group.

Available programs:

Research programs

7. Grading System

Combination of attendance, participation in discussion, and assignmnets

8. Prerequisite Reading

None

9. Reference Materials

Dent JA, Harden RM, eds. A Practical Guide For Medical Teachers. Churchill Livingstone.
Cantillon P, Wood D, eds. ABC of Learning and Teaching in Medicine. Wiley-Blackwell.

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Contact by E-mail as required

13. Note(s) to students

None

Acute Critical Care and Disaster Medicine

Lecture	(code: 7 2 3 1	1st year	:6units)
Practice	(code: 7 2 3 2	1st～2nd year	:4units)
Lab	(code: 7 2 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor Yasuhiro Otomo
Junior Associated Professor Masahito Kaji, Junichi Aiboshi
Contact person:Yasuhiro Otomo e-mail: otomo.accm@tmd.ac.jp

2. Classroom/Lab

Lectures are performed at hospital word on the first basement.
Animal testing is held at 11th floor on the M&D tower.

3. Course Purpose and Outline

The research projects interrogate the mechanisms of the human response to acute shock and trauma. Theere are research projects about trauma management and epidemiology, shock, sepsis and disaster medicine. Animal work also takes place in the basic research laboratory. Students will be assiigned to each study teams.

4. Course Objective(s)

We focus on promoting further research in the field of trauma, emergency medicine, disaster medicine and intensive care medicine. Our goal is to elucidate the medical questions of these topics.

5. Format

Lectures are performed individually.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Our mission is to understand biological human body reactions to life threatening events and to develop strategy for regulation the response. Clinical and basic research about trauma as well as the epidemiology and prophylaxis of trauma and disaster medicine are performed.
We aim to train researchers as a specialist for the field of acute critical care and disaster medicine who is able to join the Government science research.

Available programs:

Lecture as needed
Special Lecture as needed
Seminar Occasionally
Journal Club every on Tuesday at 5pm
Conference every morning

Practice

Goals/Outline:
We carry out cutting-edge treatments and develop new therapeutics, through severe emergency critical care view points, aiming at revealing pathology of body reaction to the variety of stimuli.

Available programs:

Morning lecture: every morning at 7:30
Morning conference: every morning at 8:15
Morning doctors round: every morning after conference
Research conference: monthly on Tuesday

Lab

Goals/Outline:
Our goal is to elucidate the mechanism of inflammation caused by severe insult such as trauma hemorrhagic shock and septic shock. Our research interest is especially the understanding for mechanistic link between lipid mediators and inflammatory signaling pathway.

Available programs:

Animal experiment : every day
Ask the corresponding person

7. Grading System

Students will be graded by their participation.

8. Prerequisite Reading

no need for it

9. Reference Materials

Texts are prepared individually.

10. Important Course Requirements

Not especially

11. Availability in English

None

12. Office Hour

every day 9 to 5

13. Note(s) to students

Clinical Oncology

Lecture	(code:	7 2 4 1	1st year	:6units)
Practice	(code:	7 2 4 2	1st～2nd year	:4units)
Lab	(code:	7 2 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Satoshi Miyake　E-mail: sm.conc@tmd.ac.jp

2. Classroom/Lab

To be announced.

3. Course Purpose and Outline

To overview the field of clinical oncology and aquire the systematic knowledge for palliative medicine and medical oncolgy.

4. Course Objective(s)

①To acquire the knowledge of comprehensive oncology and the skill for explain to the others.
②To facilitate the discussion in the field of multi-disciplinary collaboration.
③To acquire the method to improve patients' QOL.

5. Format

Class sizes are kept small to facilitate discussion and communication.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
① To understand comprehensive oncology.
② To have an up-to-date knowledge of palliative medicine and cancer chemotherapy.

Available programs:

Lecture　to be announced
Special lecture to be announced
Seminar　to be announced
Journal club to be announced (once a week)
Conferences to be announced

Practice

Goals/outline:
① To develop skills for communication and team approach. (Palliative Care Team)
② To develop skills in terms of assessment and management of various cancer symptoms.

Available programs:

Lab

Goals/outline:
To have an knowledge of scientific findings and practice specialized research techniques for this area.

Available programs:

Animal experiment : every day
Ask the corresponding person

7. Grading System

Grades are dependent on attendance, research work, presentation at academic meeting and publications.

8. Prerequisite Reading

To be announced.

9. Reference Materials

Oxford Textbook of Palliative Medicine

10. Important Course Requirements

To be announced.

11. Availability in English

available

12. Office Hour

e-mail: am.conc@tmd.ac.jp, Mon to Fri, 0830-1730

13. Note(s) to students

Not in particular.

Dentistry for Persons with Disabilities

Lecture	(code:	８４５１	1st year	:6units)
Practice	(code:	８４５２	1st～2nd year	:4units)
Lab	(code:	８４５３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor Osamu Shinozuka Assistant Professor Yasuka Kusumoto
Part-time Lecturer Hiroyuki Ishikawa, Youhei Takeuchi, Moriyuki Nakamura
Contact person: Osamu Shinozuka E-mail o.shinozuka.dpd@tmd.ac.jp

2. Classroom/Lab

Lecture : Room 310 on the 3rd floor of Building 10 (Library Room of Dentistry for Persons with Disabilities)
Clinical Conference : Special Care Clinic on the 1st floor of Dental Building North

3. Course Purpose and Outline

This course is designed to provide stutents with opportunity to enhance knowledge about physical , mental and medical conditions of disabilities, and to learn about dental management.

4. Course Objective(s)

Students expand knowledge about physical, mental and medical conditions of disabilities, and consider cliical application.

5. Format

Lectures and group discussion. Small-group class will be conducted.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Lectures on evaluation of intellectual disability (mental retardation, autism spectrum disorder, etc.), and physical disability (cerebral palsy, systemic disease, visual and hearing disorders, etc.), and the methods for management of these disabilities will be given.

Available programs:

Lecture Jun. 9 to Jul. 14 Tuesday 16:00～17:30
Special Lecture as needed
Seminar as needed
Journal Club as needed

Practice

Goals/Outline:
Students join the clinical work at Special Care Clinic to master diagnosis, treatment planning and behavior management for patients with special needs.

Available programs:

Clinical Conference Wednesday 16:00～17:00

Lab

Goals/Outline:
Students participate in research concerning patients with special needs, and learn the basic methods and skills for experimentation

Available programs:

Students can join any research groups at any time.

7. Grading System

The grading will be made based on the situation of participation to lectures, practices, labs and content of research. In addition, the degree of contribution in research and research meeting, number of presentation at academic meetings will be considered for comprehensive evaluation.

8. Prerequisite Reading

It is recommended to read reference material before lecture.

9. Reference Materials

日本障害者歯科学会編集:スペシャルニーズデンティストリー 障害者歯科, 医歯薬出版, 東京,2009.

10. Important Course Requirements

none.

11. Availability in English

none.

12. Office Hour

Contact Osamu shinozuka: E-mail o.shinozuka.dpd@tmd.ac.jp

13. Note(s) to students

If necessary, please contact us by e-mail.

General Dentistry

Lecture	(code:	1st year	:6units)
Practice	(code:	1st～2nd year	:4units)
Lab	(code:	2nd～3rd year	:8units)

1. Instructor(s)

2. Classroom/Lab

Not offered

Psychosomatic Dentistry

Lecture	(code: 8471	1st year	:6units)
Practice	(code: 8472	1st～2nd year	:4units)
Lab	(code: 8473	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Akira TOYOFUKU　Part-time instructor: Haruhiko MOTOMURA, Ayano KATAGIRI, Yuuichi KATO
Contact person: Akira TOYOFUKU　E-mail toyoompm@tmd.ac.jp

2. Classroom/Lab

Ask to contact person before the class

3. Course Purpose and Outline

Pursuing the pahophysiology of oral psychosomatic disorders from the viewpoint of brain-body interactions

4. Course Objective(s)

A. Understanding on MUOS(medically unexplained oral symptoms) B. Descrimination between psychatric disorders and oral psychosomatic disorders

5. Format

Hold a small class in principle and discussion as occasion demands

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goal/outline
Seminar on Analysis of Mind-body Interaction Mechanisms and Clinical Application. The aim of this lecture is to learn about the features and mechanisms of oral psychosomatic disorders, especially chronic oral pain and phantom bite and discuss the clinical application on patients.

Available programs:

Lecture　Jun.2 to Jul. 7　Tuesday 18:00～20:00
Special Lecture　any time
Seminar　any time
Journal Club　8:00～8:25 every Friday
Clinical Conference　17:00～18:00 every Monday

Practice

Goals/Outline:
Learn about clinical research on mind-body interaction mechanisms, especially on psychogenic oral pain. Method to carry out epidemiology, symptomatology and psychosocial treatment-related research of oral psychosomatic disorders including burning mouth syndrome, atypical odontalgia, oral dysesthesia and occlusal discomfort(phantom bite syndrome) will be supervised.

Available programs:

1) Clinical round by professor (every day)
2) Study on pathophysiological mechanism of oral psychosomatic disorders
3) Psychosomatic study on oro-facial medically and psychiatrically unexplained symptoms
4) Development of effective treatments for oral psychosomatic disorders in primary care

Lab

Goals/Outline:
Research on stomatosensory information-processing mechanisms between trigeminal nerve and the central nervous system. Method to carry out cognitive neuroscience, psychopharmachology, pathophysiology, and biological treatmentrelated research of oral psychosomatic disorders including burning mouth syndrome, atypical odontalgia, oral dysesthesia and occlusal discomfort(phantom bite syndrome) will be supervised. Our research focuses on body-mind pathophysiology of "phantom tooth pain", especially information processing of the pain in the brain and the descending modulatory system in the central nervous system.

Available programs:

1) Brain imaging of oral psychosomatic disorders
2) Psychopharmacological study on oral psychosomatic disorders
3) Experimental Research on chronic oral pain

7. Grading System

Participation in class, seminar and practice will be graded comprehensively(70%.In Lab,grading will be done based on contribution for the study group, reports and presentation at academic meetings(30%).

8. Prerequisite Reading

See http://atoyofpsd.net

9. Reference Materials

http://atoyofpsd.net

10. Important Course Requirements

Absence without a report is not allowed.

11. Availability in English

none

12. Office Hour

Tuesday 16:00-18:00　E-mail toyoompm@tmd.ac.jp

13. Note(s) to students

Intend to hold some special classes about 'mind' and 'consciousness' from a viewpoint of brain science and to visiting psychiatry ward.

Behavioral Dentistry

Lecture	(code:	８４８１	1st year	:6units)
Practice	(code:	８４８２	1st～2nd year	:4units)
Lab	(code:	８４８３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Shiro MATAKI E-mail mataki.diag@tmd.ac.jp
Hiroshi Nitta E-mail nitta.behd@tmd.ac.jp

2. Classroom/Lab

Generally, Lab. Room of Behavioral Dentistry (Building #10, 3F) (Practice and Lab. in an other place as needed)

3. Course Purpose and Outline

To provide patient-centered and comprehensive medical care, the student learn the availability of the approach using behavioral sciences.

4. Course Objective(s)

On practicing comprehensive medical care, students understand the significance of understanding psychosocial and behavioral scientific background of patients.

5. Format

The student attending a lecture distributes the teaching materials beforehand and explains about a content of a part in charge of. Seminar is carried out in a reading by turns form. Other reference-related documents are used as needed. The participant performs discussion based on a clinical case in all the members. The participant takes the record every time and reflects on the next time

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To practice desirable comprehensive medical care, learners get knowledge of applying behavioral sciences in providing health care

Available programs:

Lecture : Term : Oct.6 to Dec.15 Tuesday 18:00～20:00
Special Lecture : (at all times)
Seminar : Generally every Tuesday, 18:30 ～ 20:00
Journal Club: (at all times) Behavioral Dentistry, 2nd Edition
David I. Mostofsky, Farida Fortune November 2013, ©2014, Wiley-Blackwell
Conference Generally every monday, 16:30 ～ 17:30 (with staffs of General Dentistry)

Practice

Goals/Outline:
Learners will be able to get practical competence for interpersonal communication skill and statistics on behavioral sciences in health care

Available programs:

Conference, Journal Club on related readings, Case Study, Data analysis of questionnaire for Patient Satisfaction

Lab

Goals/Outline:
Learners will be able to make research plan for behavioral sciences in health care by applying learned knowledge and skills.

Available programs:

Case Study, Assistant of data analysis of questionnaire for Patient Satisfaction

7. Grading System

Integrated evaluation:
Percentage of attendance for Lecture, Practice and Lab.
Research content.
Research report
Presentation

8. Prerequisite Reading

Behavioural Sciences for Dentistry , Gerry Humphris, Margaret Ling, ELSEVIER, 2000,
Behavioral Dentistry (2nd Edition), David I. Mostofsky, Farida Fortune, Wiley-blackwell 2013

9. Reference Materials

Journal of American Dental Association (JADA)

10. Important Course Requirements

none

11. Availability in English

none

12. Office Hour

Wednesday, 17:00-18:00,
Please get in touch with me in advance. E-mail: mataki.diag@tmd.ac.jp

13. Note(s) to students

none

Temporomandibular Joint and Oral Function

Lecture	(code: 8491	1st year	:3units)
Practice	(code: 8492	1st～2nd year	:4units)
Lab	(code: 8493	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Koji Kino E-mail k-kino.tmj@tmd.ac.jp

2. Classroom/Lab

We will decide it according to a program.

3. Course Purpose and Outline

We will explain about characteristic of TMD that is multifactorial disease, and introduce some statistic methods necessary to factor analysis in multifactorial disease.

4. Course Objective(s)

Understanding the charactaristic of TMD, and explaining both types and characteristics of multivariate data analysis.

5. Format

Lectures and discussions in a small group

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To understand physiological systems of a mandible, masticatory muscles and occlusion those maintain a jaw function.
To understand pathologic conditions, etiologic factors, diagnoses and therapies for abnormalities and disorders of a temporomandibular joint and masticatory muscles, because these abnormalities and disorders, especially temporomandibular disorders, inhibit normal jaw function, decrease a QOL and bring instability of occlusion, then make it difficult to reconstruct an appropriate occlusal relationship.
Temporomandibular disorders are recognized as multi-factorial diseases. It has been understood that a symptom begin and is prolonged by piling up of several factors, such as psychological factors, behavioral factors and anatomical factors. There are various factors to associate with etiology and with prolongation of symptom. Statistical procedure, especially multivariate analysis, is necessary to clarify this association. We give an outline about those statistical procedures in this lecture.

Available programs:

Lecture 17:30-19:30 on Wednesday, Oct.28-Nov.18 Four times
Special Lecture at any time

Practice

Goals/Outline:
To understand diagnoses and roles of contributing factors on onset and perpetuation of temporomandibular disorders by coming in contact with patients in our clinical office.

Available programs:

Clinical office; Mon, Wed, Thu 9:00-12:00

Lab

Goals/Outline:
To understand an importance of statistical methods for clinical study, and to select an appropriate method and use it on own study.

Available programs:

Anytime when a study theme decided.

7. Grading System

Participation in class, seminar and practice will be graded comprehensively. In Lab, grading will be done based on contribution for the study group, reports and presentation at academic meetings.

8. Prerequisite Reading

There is nothig to prepared.

9. Reference Materials

none

10. Important Course Requirements

none

11. Availability in English

English lecture is not performed.

12. Office Hour

Akira Nishiyama Mon to Fri 17:00-20:00 (E-mail anishi.tmj@tmd.ac.jp)

13. Note(s) to students

none

Professional Development in Health Sciences

Lecture	(code:	７９５１	1st year	:6units)
Practice	(code:	７９５２	1st～2nd year	:4units)
Lab	(code:	７９５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kazuki TAKADA
Associate Professor: Jun TSURUTA
Associate Professor: Mina NAKAGAWA
Junior Associate Professor: Kumiko YAMAGUCHI
Contact person: Jun TSURUTA E-mail: turucie@tmd.ac.jp

2. Classroom/Lab

All sessions will be held at the Center for Interprofessional Education, 8th floor south, M&D Tower

3. Course Purpose and Outline

While age-associated physiological changes, increased numbers of comorbid systemic conditions, and an issue of polypharmacy all jeopardize oral hygiene status of the elderly, periodontal diseases, which result from decreased oral hygiene status, predispose to and aggravate diabetes and cardiovascular diseases. In addition, the advancement in medical and dental sciences have blurred boundary between medical and dental care. Therefore, the aging society in the 21st century requires coordinated and collaborative care between medical, dental, and other health professionals. Furthermore, the advancement in information technology and rapidly increasing human mobility continue to blur boundary between countries or states. Education and professional development for health professionals need to continue to evolve as well as to adjust to such concurrent societal needs. Coursework, activities and projects, and research that students engage aim to produce leaders in health professional education who could assess concurrent societal needs for healthcare and develop appropriate curriculum by drawing on key pedagogical theories and learning methods and by using a process-based approach and outcome logic models.

4. Course Objective(s)

At the end of the course, students will be able to:
1) Describe the history, legality, and entire scheme (from undergraduate and graduate education and to continued professional development) of medical and dental education in Japan
2) Describe systems, accreditation, and quality control measures for health professional development in Japan and other countries
3) Describe key educational theories and learning methodologies which draw on those theories
4) Describe and effectively use a process-based approach and an outcome logic model in planning and running curriculum
5) Conduct survey and analysis necessary for societal needs assessment, set appropriate learning goals based on survey results, and select assessment methodologies appropriate for the goals
6) Design a logical and feasible cccurriculum that best fits its ecosystem

5. Format

Students' learning activities include participation to lectures, various activities, project work, and research. Lectures are bidirectional and student-centered, and students are expected to come well-read and prepared and to participate actively. Program is organized based on the experiential learning theory by David Kolb, incorporating components of reflective observation, abstract conceptualization, active experimentation, and concrete experience.

6. Course Description and Timetable

Check with the course instructors for session schedules and timetable.

Lectures

Goals/outline:
Lectures are bidirectional, are student-centered, and provide opportunities for learners to acquire high-level and practical knowledge of the followings: history of medical and dental education in Japan, professional education/development/certification in Japan and North American/European countries, key pedagogical theories and learning methods, process-based approach and logic models in curriculum development, and competencies and their assessment/evaluation.

Available programs:

Lectures/activities/project work: 14:00-15:00 Tuesday
Seminars: To be announced
Journal club: 8:00-9:00 Thursday

Activities and project work

Goals/outline:
Students will engage in various activities and project work to apply knowledge and skills they acquire through lectures. Examples of activities/project work are societal needs assessment (survey and analysis) for future health professionals, defining competencies/choosing appropriate learning methods and assessment/evaluation methods, and developing curriculum using process-based approach and logic models.

Available programs:

Lectures/activities/project work: 14:00-15:00 Tuesday (could be extended into other hours or days of the week)

Research

Goals/outline:
By participating in our research activities, students will become able to recognize unresolved clinical or scientific questions, formulate an hypothesis, identify methods and resources to address this hypothesis, understand the scientific theory and methodology (both quantitative and qualitative) that form the basis of medical discoveries, communicate new knowledge obtained from scientific inquiry responsibly and clearly, and understand the ethical requirements for human-oriented scientific inquiry.

Available programs:

・Needs assessment in health care and in professional development in health science fields
・Curriculum development for professionals of the future needs in health sciences
・Interprofessional education curriculum development

7. Grading System

Students will be graded based on their active participation to class sessions, activities, project work, research, and academic activities (participation to and presentation at domestic and international research conference).

8. Prerequisite Reading

Come to class prepared and ready to participate actively, by reading assigned texts and other required materials carefully and comprehensively before the class session. Participate in class through active listening, taking notes, asking questions, taking part in discussions, engaging your mind on the topic matter, and respecting other people's viewpoints. Always raise your hand before sharing something with the class. Students who do not participate in class discussions or who do not ask questions may be believed to be unprepared for class. Study outside of class by reviewing course notes after each class session and studying in small groups with classmates.

9. Reference Materials

1) Understanding Medical Education: Evidence,Theory and Practice: Tim Swanwick, Wiley-Blackwell, 2010
2) Curriculum Development for Medical Education: A Six-Step Approach: David E. Kern、Patricia A. Thomas、Mark T. Hughes, The Johns Hopkins University Press, 2010
3) Professionalism in Medicine: A Case-Based Guide for Medical Students: John Spandorfer、Charles A. Pohl, Cambridge university Press, 2010
4) Assessment in Health Professions Education: Steven M. Downing, Rachel Yudkowsky, Routledge, 2009
5) Millennials Rising: The Next Great Generation: Neil Howe、William Strauss, Random House LLC, 2000
6) A Practical Guide for Medical Teachers: John A. Dent, Ronald M. Harden, Churchill Livingstone, 2013
7) Qualitative Research & Evaluation Methods: Integrating Theory and Practice: Michael Quinn Patton, SAGE Publications, Inc, 2015

10. Important Course Requirements

Dates, time, and location of each session are subject to change. Please check with the most updated course syllabus.

11. Availability in English

In the presence of students who are not native Japanese speakers, sessions of this course will be provided in English.

12. Office Hour

Kazuki Takada (Professor): 14:00 - 15:00 Thursday
Jun Tsuruta (Associate professor): 15:00-16:00 Friday
Mina Nakagawa (Associate professor): 16:00-17:00 Thursday
Kumiko Yamaguchi (Junior associate professor): 16:00-17:00 Tuesday

13. Note(s) to students

Neuroanatomy and Cellular Neurobiology

Lecture	(code: ７２５１	1st year	:6units)
Practice	(code: ７２５２	1st～2nd year	:4units)
Lab	(code: ７２５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Sumio TERADA, Assistant Professors: Masahiko KAWAGISHI, Kenta SAITO, Keisuke SATO
Contact person: Sumio TERADA　E-mail: terada.nana@tmd.ac.jp

2. Classroom/Lab

Lecture:
　Conference and Seminar, Journal Club
　　Staff Room 1/2, Department of Neuroanatomy and Cellular Neurobiology (Building 3, 13th floor)
　Special Lecture　To be announced.
Practice:
　Cellular neurobiology practice (Basic)
　　Refer to the medical school timetable (Neuroanatomy).
　Cellular neurobiology practice (Advanced)
　　Lab Rooms, Department of Neuroanatomy and Cellular Neurobiology (Building 3, 13th floor)
　Journal Club, Conference and Seminar
　　Staff Room 1/2, Department of Neuroanatomy and Cellular Neurobiology (Building 3, 13th floor)
Lab:
　Lab Rooms, Department of Neuroanatomy and Cellular Neurobiology (Building 3, 13th floor)
　EM Room, Instrumental Analysis Research Division, Research Center for Medical and Dental Sciences (Bulding 8 South, 3rd floor)

3. Course Purpose and Outline

The aim of this course is to provide students with a basic understanding of the morphological organization of the human nervous system as well as neuroanatomical methodologies in sufficient depth to form the basis for further research studies.

4. Course Objective(s)

(1) To provide an overview of the organization of the nervous system and to understand its ultrastructure and cytoarchitectures.
(2) To obtain a basic understanding of the spectroscopic techniques used to investigate morphological and functional connectivity of neurons.

5. Format

Special Lectures are open to every student interested in attending.　Limited to 5-6 students in other programs.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To discuss morphological and molecular cell biological basis of selected studies .　Topics include cellular neurobiology and other related areas with special reference to microscopic and spectroscopic techniques.　Special lectures by prominent researchers are arranged irregularly.

Available programs:

Conference and Seminar　From 2:00 PM, on every other Friday.
Special Lecture　To be arranged.
Journal Club　To be arranged.

Practice

Goals/Outline:
Survey of the anatomy and functional organization of the human central nervous system with clinical applications, from basic to expert level. Advanced level of survey (including specialized journal club, and/or conference) is arranged, if necessary.

Available programs:
Cellular neurobiology practice (Basic) Refer to the medical school timetable (Neuroanatomy).
Cellular neurobiology practice (Advanced) To be arranged.
Journal Club To be arranged.
Conference and Seminar From 2:00 PM, on every other Friday.

Lab

Goals/Outline:
Lectures and laboratory treating the central nervous system from the ultramicroscopic points of view are arranged.

Available programs:

Cellular neurobiology lab Consult the course manager. Over two solid weeks are necessary.

7. Grading System

Grading will be based on class participation (100% for Lecture and Practice, 75% for Lab) and on a short paper (25% for Lab) in English or Japanese.

8. Prerequisite Reading

Prerequisite: Basic undergraduate-level knowledge on biomedical sciences

9. Reference Materials

1. Jackson MB. Molecular and Cellular Biophysics. Cambridge Univ Press; 1st ed (2006).
2. Hayat MA. Principles and techniques of electron microscopy. CRC Press; 3rd ed (1989).

10. Important Course Requirements

Consult your academic advisor in advance on schedule before taking the course.

11. Availability in English

Available in English, if necessary.

12. Office Hour

Pre-inquiry by e-mail (terada.nana@tmd.ac.jp) is preferable.

13. Note(s) to students

Enrollment limited up to 5-6 students except Special Lectures.
Prereq; Permission of instructor for non-medical students.
Preference to non-medical graduate students for Cellular neurobiology practice (Basic).

Systems Neurophysiology

Lecture	(code:	7261	1st year	:6units)
Practice	(code:	7262	1st～2nd year	:4units)
Lab	(code:	7263	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Izumi Sugihara Associate Professors: Yuriko Sugiuchi, Yoshiko Izawa

2. Classroom/Lab

Office room of the professor (Building 3, 14th floor)

3. Course Purpose and Outline

We hope that the participants can learn knowledge, research techniques, and way of thinking in neuroscience, or neurophysiology and related fields in particular by attending our courses.

4. Course Objective(s)

We hope each participants can obtain capability of planning, conducting and evaluating neuroscience research.

5. Format

Weekly lectures are designed for a small group of participants. Practices are designed for a small number of students. All the courses can be in English.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The nervous system is studied in a variety of ways from gene, molecular through cellular, neural network, and in vivo levels because of its anatomical complexity and functional diversity. The goal of our education is for students to understand the link between the morphology and function of the nervous system through neurophysiological approaches mainly at the neural network level and to learn a way of thinking about further questions about the nervous system, including those about pathological states of the nervous system in diseases. For this purpose, we give lectures on the neural structure, network, function, development and molecular expression of the cerebellum, cerebrum, basal ganglia, and brainstem.

Available programs:

Weekly graduate course lecture Every Monday 18:00～19:00
Special Lecture April 28, 17:00～19:00 (planned)

Practice

Goals/Outline:
To support for students to learn for themselves basic matters in neuroscience and neurophysiology, we provide technical practices, journal club and seminars for progress reports. Technical practices include basic electronics (e.g. designing and making an amplifier), computer simulation programming, and analysis of neural networks using light and fluorescent microscopes.

Available programs:

Journal Club (or reading circle) Every monday 17:00~18:00
Lab practice arbitrary

Lab

Goals/Outline:
To understand the structural and functional organization of the nervous system, we support for students to learn electrophysiological techniques and neuronal labeling in anesthetized animals, in trained animals and in vitro preparations. We recommend students to learn data acquisition by computers, analysis of neural activity, and basic statistical analysis. Students can also participate in basic analysis of labeled neural networks.

Available programs:

Experiments and data analysis
Experiments include anesthesia, brain surgery (injection of tracers), perfusion, electrical microstimulation, recording and analysis of neural activity, neuronal labeling with immunohistochemical techniques, and three-dimensional mapping with a light microscope.

7. Grading System

We evaluate students generally based on progress reports on their studies and presentations at meetings in addition to attendance at lectures, practices, and experiments.

8. Prerequisite Reading

Participants have to prepare their presentation in the lecture. They have to read through the article for the Jornal Club. They are supposed to arrange other things with the instructor (professor).

9. Reference Materials

Textbook: Bear et al., Neuroscience, Exploring the Brain, Lippincott.

10. Important Course Requirements

Nothing special

11. Availability in English

All courses can be in English.

12. Office Hour

Contact person: Izumi Sugihara E-mail isugihara.phy1@tmd.ac.jp, Office hour: 8:30-17:15 daily.

13. Note(s) to students

http://www.tmd.ac.jp/med/eng/eng/phy1-E.html

Pharmacology and Neurobiology

Lecture	(code:	7 2 7 1	1st year	:6units)
Practice	(code:	7 2 7 2	1st～2nd year	:4units)
Lab	(code:	7 2 7 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Tsutomu Tanabe Assistant professor: Hironao Saegusa, Makoto Fujikawa, Daisuke Tanaka
Contact person: Tsutomu Tanabe E-mail t-tanabe.mphm@tmd.ac.jp

2. Classroom/Lab

Special lecture course and practice course are in the laboratory No. 1 and lab works are in the other laboratories.

3. Course Purpose and Outline

Many intriguing mysteries left in the issue of brain function like (1) learning and memory, (2) cognition and behavior, (3) generation of consciousness, (4) personality and mentality. On the other hand, in the modernday world with a complicated human relations and prolonged life span, necessity of deeper understanding and development of the means to cure the numerous neurological disorders and pain is enormously increased.

4. Course Objective(s)

1. Become a scientist capable of lecturing science to students.
2. Become a scientist capable of conducting major experiments by him/herself.
3. Become a scientist capable of preparing a research plan by him/herself.
4. Become a scientist capable of writing a grant proposal by him/herself.

5. Format

Small group (5~6 persons) study

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
In the brain function like (1) learning and memory, (2) cognition and behavior, (3) generation of consciousness, (4) personality and mentality, many intriguing questions are still remained to be answered. On the other hand, in the era of satiation and longevity, needs for preventing and treating numerous neurological disorders and pain have been risen. For the purpose of integrating the accumulated findings of the neuronal function at the molecular and cellular level into the ones at the system level, we will lecture the subjects on (1) Neurotransmitter receptors, G-proteins and ion channels, (2) Ion channelopathies, (3) Neurodegeneration and functional disturbance in the central nervous system, (4) Central control of pain perception and sensation, (5) Pharmacological control of stem cell proliferation and differentiation in this special lecture course.

Available programs:

Lecture	Monday 17:00-18:00
Special Lecture	Graduate School of Medicine Lecuture Series 31 times/year
Seminar	Once a month
Journal Club	Monday 11:00-12:00 Thursday 17:30-18:30

Practice

Goals/Outline:
1. Acquire the skills of preparing an informative presentation and develop an effective way of presenting results in the audience.
2. Understand the meaning of the research conducted and learn how to figure out the meaningful future directions from the conclusions.
3. Practice answering the questions raised by the audience.

Available programs:

Conference report on-demand basis
Progress report once a month for each small group
Research presentation twice a year

Lab

Goals/Outline:
During the first couple of months, students are requested to acquire basic techniques of biochemistry, molecular biology, pharmacology and electrophysiology that are routinely used in our laboratory. Then students will be given a small project to do using the techniques they have learned during the initial training. Students are also required to read relevant scientific papers and conduct seminar style lectures to other lab members monthly. After completion of the initial phase, students start their own project under the supervision of the faculties in the lab.

Available programs:

1. Regulation of Microglial Ca channel function in Neuroinflammation/Neurodegenerative diseases
2. Regulation of Macrophage Ca channel function in Inflammatory bowel disease and Rheumatoid arthritis
3. Energy metabolic imaging at single cell level of cancer stem cell/cancer cell using Bioluminescence and FRET and Imaging
4. Energy metabolic imaging at single cell level of neuron, microglia and astrocyte in the degenerative area of the mouse model of various neurodegenerative diseases
5. Neural mechanisms of pleasure and motivation in feeding
6. Molecular basis of Calcium channelopathy
7. Alteration of Neuron-Glia interaction in Neurological disorders

7. Grading System

Grading is based on the wide-ranging evaluations, including attendance record and the degree of contribution on the course.

8. Prerequisite Reading

Read reviews and original papers covering the fields and understand the contents. Read the textbook of brain science and neuroscience to deepen the knowledge related to the fields.

9. Reference Materials

Principles of Neural Science (5th ed.) McGraw Hill, 2013. ISBN 9780071390118
Molecular Biology of the Cell (5th ed.) Garland Science, 2007 ISBN 9780815341055

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Office hours are not especially provided. Make an appointment by e-mail (t-tanabe.mphm@tmd.ac.jp) before visiting.

13. Note(s) to students

none

Molecular Neuroscience

Lecture	(code:	７２８１	1st year	:6units)
Practice	(code:	７２８２	1st～2nd year	:4units)
Lab	(code:	７２８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kohichi Tanaka
Contact person: Molecular and Cognitive Neuroscience Kohichi Tanaka　E-mail tanaka.aud@mri.tmd.ac.jp

2. Classroom/Lab

Please confirm venue with instructors

3. Course Purpose and Outline

The final goal of this course is to understand molecular, cellular, and neuronal ensemble mechanisms underlying higher order brain functions including learning and memory. For that purpose, we teach molecular genetics, physiological and behavioral methods.

4. Course Objective(s)

Connecting neural mechanisms of behavior to their underlying molecular and genetic substrates

5. Format

All programs will be held with small-group. We will provide opportunities for discussions as much as possible to improve communication with students.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Cognition consists of sensory inputs from vision, somatic sensation, hearing, olfaction and taste, and memory retrieved from these. In this lecture, we will review the latest findings of mechanism of sensation and memory, the fundamental processes of cognition, at the level of molecule, cell, system and behavior. Furthermore, we address how sum of these findings constitutes cognition.

Available programs:

Journal Club　Every Friday 11:00 - 12:00

Practice

Goals/Outline:
The aim of this practice is to learn molecular biological, anatomical, electrophysiological and psychological approaches to elucidate the mechanism of cognition. Moreover, based on previous case reports of cognitive deficits, students should plan and discuss what kinds of the researches are possible and meaningful to elucidate the pathology of these diseases, leading to unveil the mechanism of cognition.

Available programs:

Progress Report, Every Friday 10:00 - 11:00 Every third Friday 13:00 - 16:00

Lab

Goals/Outline:
Students should generate genetically modified animals to comprehensively understand the cognitive mechanisms at the level of molecule to behavior. Then, students should analyze cognitive deficits of mutant animals and those molecular mechanisms.

Available programs:

Participation in the ongoing research project; as needed
Training for cell biology: five times a year 13:00 - 16:00

Experiment:
1. Gene cloning and generation of targeting vector.
2. Generation of genetically modified mice
3. Behavioral analysis of the mice
4. Morphological analysis of central nervous systems.

7. Grading System

Students are evaluated for their participation in course, research reports, presentations at academic meetings and publications.

8. Prerequisite Reading

N/A

9. Reference Materials

・「Neuroscience-Exploring the brain」(Lippincott Williams & Wilkins)
・「From Neuron to Brain」(Sinauer)

10. Important Course Requirements

N/A

11. Availability in English

Available

12. Office Hour

8:30—12:00

13. Note(s) to students

In principle, progress report and journal club are hold with less than ten participants.

Neuropathology

Lecture	(code:	７２９１	1st year	:6units)
Practice	(code:	７２９２	1st～2nd year	:4units)
Lab	(code:	７２９３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Hitoshi Okazawa　　E-mail　okazawa.npat@mri.tmd.ac.jp

2. Classroom/Lab

Need to check with professor in advance; classes are different in each program.

3. Course Purpose and Outline

Understnading of the outline of research on neurodegenrative diseases and developmental disorders

4. Course Objective(s)

Obtaining the ability to design and perform original research

5. Format

The size of the class should be small. In order to stimulate interaction with participants, the class will be discussion - oriented one.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　Recently, not only elucidation of molecular mechanisms underlying neurodegenerative disease pathology, but also development of therapeutic approaches utilizing the elucidated molecular mechanisms has been extensively progressed. In this lecture, while we teach students the latest progress in the field, we will especially focus on understanding of aggregation of abnormal disease protein and molecular alteration or impairment of functional proteins caused by the protein aggregation in neuronal cells

Available programs:

Lecture　As scheduled
Special Lecture　As scheduled
Seminar　As scheduled
Journal Club　Once a week: 13:00-15:00
Conference　As scheduled

Practice

Each lab member should systematically describe their research progress and the knowledge in related field in short time. Advices to develop members' presentation skills will be given.

Available programs:

Lab

Goals/Outline:
　To elucidate molecular mechanisms underlying neurodegenerative diseases and to develop new therapeutic approaches utilizing the molecular mechanisms obtained. We generally use fly and mouse models expressing the disease genes in neurons. Techniques that we use are: molecular biology using plasmid, cosmid, and virus vector; immunohistochemistry; primary culture of neuronal cells and neural stem cells; creation of genetically modified mouse.

Available programs:

Rehearsals and reports for conferences: As needed
Research progress report: Tuesdays and Thursdays 17:00-18:00

7. Grading System

Evaluate based on quality of research reports, presentations in conferences, and /or scientific papers.

8. Prerequisite Reading

Related papers wold be suggested in each occasion

9. Reference Materials

popose students in each project

10. Important Course Requirements

n.a.

11. Availability in English

available

12. Office Hour

10AM-6PM

13. Note(s) to students

Number of participants for journal club and research meeting in the lab should be around 10 people.

Ophthalmology and Visual Science

Lecture	(code:	７３０１	1st year	:6units)
Practice	(code:	７３０２	1st～2nd year	:4units)
Lab	(code:	７３０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor; Kyoko Ohno-Matsui, Junior Associate Professor; Hiroshi Takase, Koju Kamoi
Contact person: Kyoko Ohno-Matsui　　E-mail　k.ohno.oph@tmd.ac.jp

2. Classroom/Lab

Ask the instructor for details

3. Course Purpose and Outline

Basic and advanced learning of ophthalmology

4. Course Objective(s)

To learn the knoledges and skills required in ophthalmic research

5. Format

To discuss the details of research protocols in a small group and to provide some lectures to facilitate the students to make their own research plan

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　To understand the pathophysiology of various tissues within the eye and visual pathways and to understand the pathogenesis, diagnosis, and treatments of various ocular disorders

Available programs:

Lecture　as needed
Special Lecture　as needed
Seminar　as needed
Journal Club　as needed
Conference (clinical); every Wednesday

Practice

Goals/Outline:
　To realize the diagnostic procedures and treatment strategies against various ocular disorders

Available programs:

Research progress; once a month, fourth Monday,　Spot diagnosis; once a month, second Monday
Clinical Conference: every Wednesday

Lab

Goals/Outline:
　To investigate the pathogenesis of various ocular disorders using surgically obtained specimens or human eye samples by immunological, molecular biological, and pathological methods

Available programs:

research progress; once a month, second Tuesday

7. Grading System

Grade evaluation is comprehensively performed according to the attendance at conference, lecture and practice, the attidude shown by the presentation and making comments during the discussion, the research content, and the number of conference presentation as the first author.

8. Prerequisite Reading

Reading texbooks of ophthalmology or basic research in this field.

9. Reference Materials

The Eye :Basic Science in Practice (SAUNDERS) etc

10. Important Course Requirements

Nothing particularly

11. Availability in English

As needed

12. Office Hour

Please contact and ask our department.

13. Note(s) to students

We would like to recruit the students who are highly motivated and interested in visual science and ophthalmology.

Otorhinolaryngology

Lecture	(code: 7311	1st year	:6units)
Practice	(code: 7312	1st～2nd year	:4units)
Lab	(code: 7313	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Takeshi Tsutsumi
Contact person: Atsunobu Tsunoda E-mail at.hns@tmd.ac.jp

2. Classroom/Lab

Please contact the leaders prior to lecture.

3. Course Purpose and Outline

Achieve the ability to perform the correct diagnosis and treatment of the disease in otorhinolaryngolgy and to design the basic research to analyze the pathophysiology of the disease in otorhinolaryngology.

4. Course Objective(s)

To study subjects of otolaryngology, that is, signs and symptoms of hearing loss, dysequilibrium, respiration, smell, swallowing, phonation. Also to research these pathologies using techniques of molecular biology, morphology and physiology.

5. Format

Small group teaching is principle. Through mini-conference and one-minute lecture, thorough discussion with lecturer, is planned.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Otorhinolaryngology manages various organs and disorders in ear, nose, throat, head and neck regions. Therefore, lots of signs, symptoms and disorders, that is, hearing disturbance, dysequilibrium, respiration, olfaction, swallowing, phonation, are research objects of otorhinolaryngology. Especially, communication disturbance concerning listening and speaking are featured speciality in otorhinolaryngology. Above mentioned organs have extremely precise mechanism, therefore, they suffer damages from various kinds of diseases, such like circulatory disturbance, infection, neoplasm and trauma. With current progress in molecular biology, novel mechanisms of otorhinolaryngological diseases will be investigated and the new prospects of the treatment will be presented.
In this course, we lecture pathology, etiology, diagnosis and treatment of otorhinolaryngological disorders with latest topics.

Available programs:

Special Lecture As occasion demands
Journal Club Every Tuesday morning.
Conference Every Tuesday evening

Practice

Goals/Outline:
You will learn basic diagnostic techniques, examinations and data interpretations in otorhinolaryngology. Following subjects should be mastered; Techniques: otoscope, rhinoscope, laryngoscope.
Examinations: Hearing tests including pure-tone, speech, Bekesy, impedance audiometry, tubal function testing, otoacoustic emission, electrocochleogram, auditory brainstem response. Equillibrium tests including standard tests, electronystagmography, gravicorder and three dimensional occulography. Rhinological test: smell test and rhinometry. Diagnostic observation: middle ear, paranasal sinus, nasopharynx, larynx and hypopharyngeal endoscope. Ultrasonography: parotid, submandibular gland, thyroid, parathyroid and lymph node.
Data interpretations: After obtaining these data, you interpret the data and make an appropriate diagnosis and treatment for the patients by yourself.
In addition to these program, cadaver dissection for temporal bone, nose and paranasal sinus, head and neck will be scheduled.

Available programs:

Neuro-otological conference: Every Tuesday (17:00-18:00)
Professor round: B10 Ward: Every Tuesday (9:00-10:00)
Clinical conference: Every Tuesday (18:00-19:00)
Research seminar: 10 times per year, Thursday evening.

Lab

Goals/Outline:
Mechanism causing otorhinolaryngological disorder varies, therefore, anatomy and physiology should be mastered. After that, clinical data, such as diagnosis and treatment outcome of the patient, are investigated and analyzed. Through these processes, your task is to investigate new features of pathology, and also to develop novel diagnostic methods and treatments. For this purpose, you can perform basic research using an animal model. In the laboratory, techniques of molecular biology, morphology, histopathology and electrophysiology are used.

Available programs:

1) Molecular biology in hearing and dysequillibrim disorder.
2) Clinical studies on dysequillibrim disorder and its treatment.
3) Electrophysiological research in cochlear pathology (basic and clinical researches)
4) Investigation of images and image-guided surgery in this area.

7. Grading System

Achievement of attendance to the lecture, seminar, laboratory is evaluated. Research report and presentation in convention are also estimated. Your overall activity will be assessed.

8. Prerequisite Reading

Please consulrt to lecturer.

9. Reference Materials

Modern Oto-Rhino-Laryngology, Yasuya Nomura, Kimitaka Kaga(Editors), 2013 Nanzando, Tokyo

10. Important Course Requirements

Noen

11. Availability in English

None

12. Office Hour

Every Friday 16-18: Dr. A. Tsunoda E-mail: at.hns@tmd.ac.jp

13. Note(s) to students

No limitation for applicant. Presenter in the journal group will be limited to 10 persons.

Neurology and Neurological Science

Lecture	(code:	7 3 2 1	1st year	:6units)
Practice	(code:	7 3 2 2	1st～2nd year	:4units)
Lab	(code:	7 3 2 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor and Chairperson: Takanori Yokota
Junior Associate Professor: Nobuo Sanjo, Satoru Ishibashi
Assistant Professor: Takuya Ohkubo, Yoichiro Nishida, Nozomu Sato, Kokoro Ozaki
Contact person: Takuya Ohkubo (Manager)
E-mail: ohkunuro@tmd.ac.jp

2. Classroom/Lab

Please check the website or office board for locations of lectures: Conference Room (B11F, medical hospital), Neurology and Neurological Science Laboratories (12F, 15F Building III), etc.

3. Course Purpose and Outline

Students have to understand characteristics of neurological diseases as a research object, through getting lecutures and practical trainings for a proceeding of elucidating the pathogenic mechanisms, and development and improvemet of diagnostic proceedures or evaluation of the diseases.

4. Course Objective(s)

Students have to understand characteristics of neurological diseases as a research object, and acquire at least one method (technique) to perform elucidating the pathogenic mechanisms, or development and improvemet of diagnostic proceedures, evaluation or treatment of the diseases. Students will perform their projects and get a results using the methods.

5. Format

Students are trained by performing experiments, taking lectures and practicing in a small group. Throughout this course, students learn not only experimental techniques but also gain ideas and how to solve problems through discussions.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline:
Neurology and Neurological Science is a very broad, multidisciplinary field including degeneration, demyelination, paroxysmal disorder, vascular disorder, and inflammation that occurred in the central nervous system, peripheral nervous system, autonomic nervous system, and skeletal muscle.
Our field covers wide spectrum of neurological disorders, from those that are acute (e.g. stroke, disturbance of consciousness and seizure) to chronic/slowly progressive diseases (e.g. Alzheimer's disease), from common (e.g.epilepsy, headache) to very rare diseases, and from easily curable to intractable diseases. Throughout this doctoral course, the faculty and staff provide continued supports, explaining not only overview of the diseases but also new research methods such as molecular genetics, molecular biology, genetic engineering, immunological approach in order to elucidate causes and pathogenesis of these diseases and to establish therapies.

Available programs:

Lecture

Special Lecture (e.g. ONSA seminar)	twice a year	
Ochanomizu Brain Science Seminar	twice a year	
Research Seminar	every Wednesday	19:00 – 20:00
Clinical Pharmacology Seminar	every Tuesday	16:00 – 16:15
Neurology Seminar	every Tuesday	16:15 – 16:30
Neurological culture/biochemistry research seminar	every Monday	19:00 – 20:30
Neurological molecular genetics research seminar	every Tuesday	20:00 – 21:30
	every Thursday	18:00 – 20:00
Genetic therapy research seminar	every Tuesday	17:00 – 19:00

Practice

Our curriculum provides a program to practice the evaluation processes, enabling students to understand pathophysiology of cerebrovascular disorders, neurodegenerative diseases, and neuroimmunological diseases based on clinical examination and various laboratory examinations including neuroimaging study such as PET and MRI. In addition, the students practice the diagnostic process as well as process of deciding and performing a treatment.

Available programs:

Clinical neurology ward round	every Tuesday	8:00 – 12:00, 13:30 – 15:30
Professor's Morning ward round	every Weekday	8:30 – 9:00
Clinical conference	every Tuesday	8:00 – 9:00
Neuromuscular conference	every Monday	16:30 – 18:00
Electrophysiological examination conference	every Monday	18:00 – 20:00
Neurological molecular genetics practice	every Tuesday	19:00 – 20:00
Neurological vascular disorder practice	every Wednesday	20:00 – 20:30
Neuroimmunology conference	every Thursday	17:00 – 19:00
Neuroimaging conference	every Thursday	17:00 – 19:00
Stroke conference	alternate Wednesday	18:00 – 19:00
Integrated clinical conference	the 2nd Wednesday	19:00 – 20:00

Lab

Goals/Outline:
We conduct experiments by using immunological, molecular biological and molecular genetic methods in order to elucidate genes which are risk factors or causes of neurological diseases, metabolic derangement that leads to neuronal death, pathogeneses, and treatment for autoimmune diseases (e.g. Multiple Sclerosis, Myasthenia Gravis). We also carry out clinical studies using electrophysiological and neuroimaging techniques in order to elucidate pathophysiology.

Available programs:

Molecular genetics experiment	Everyday	available any time
Molecular biology experiment	Everyday	available any time
Biochemistry experiment	Everyday	available any time
Immunology experiment	Everyday	available any time
Morphology experiment	Everyday	available any time
Neuroimaging experiment	Every Thursday	available any time
Electrophysiology experiment	Every Tuesday, Wednesday	available any time

7. Grading System

Students are evaluated based on their participation in the lectures, internships and experiments as well as their presentation at conferences and seminars. Publication of original papers is highly evaluated.

8. Prerequisite Reading

Students should make a contact with their teachers (primary investigators) to check textbooks and reference literatures. They are requrired to read those textbooks and well prepare for the lecutrs and practical trainings.

9. Reference Materials

Students should ask their teachers (primary investigators) because textbooks are different accoding to their projects.

10. Important Course Requirements

Not particularly.

11. Availability in English

Available

12. Office Hour

Mail to contact person (manager): Takuya Ohkubo: ohkunuro@tmd.ac.jp

13. Note(s) to students

The curriculum aims to provide education in a small group. Therefore, we may select applicants if candidates exceed the number of available enrollment spaces.

Psychiatry and Behavioral Sciences

Lecture	(code:	7331	1st year	:6units)
Practice	(code:	7332	1st～2nd year	:4units)
Lab	(code:	7333	2nd～3rd year	:8units)

1. Instructor(s)

Toru Nishikawa, Professor
Contact person: Toru Nishikawa TEL 5803-5237 E-mail tnis.psyc@tmd.ac.jp

2. Classroom/Lab

Office of the Professor, outpatient station conference room at the University Hospital, and other seminar rooms.

3. Course Purpose and Outline

This course aims at understanding the mechanisms of the brain function and dysfunction underlying the expression of cognition and behavior, as well as the etiology and pathophysiology of mental disorders by using using molecular neurobiology, molecular genetics, neuroimaging, and neurophysiology. Fundamental knowledge of mental disoders, which is cruciall to understand the prevention and development of novel treatment of the diseases, will be provided during the course.

4. Course Objective(s)

The goals of this course are: 1) To understand major symptoms, treatment and hypothetical etiologies of schizophrenia, mood, anxiety, and other mental disorders, 2) To understand the mechanims of action of antipsychotics, antidepressants, anxiolytics, antiepileptics and others, and 3) To understand psychotherapy and other treatment and care of mental disorders.

5. Format

Small group tutorial style by mentors, including research progress meeting, at-the-bench discussion, and journal seminars.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The lecture course aims at understanding the mechanisms of the brain function and dysfunction underlying the expression of cognition and behavior, as well as the etiology and pathophysiology of mental disorders. The methodologies of basic and clinical research using cutting-edge technologies of molecular neurobiology, molecular genetics, neuroimaging, and neurophysiology will be instructed. Prevention and development of novel treatment of the diseases will be further discussed.

Available programs:

Lecture	as occasion demands
Special Lecture	as occasion demands
Seminar	as occasion demands
Journal Club	every other Monday 18:00-19:00
Conference	every other Thursday 18:00-19:00

Practice

Goals/Outline:
Training session program will be provided to master the internationally standardized classifications of operational diagnosis and the clinical scaling tools for psychiatric diseases. The basics for the planning of treatment based on the comprehension of the psychiatric symptoms and diagnosis process will be acquired through clinical pharmacology, neuroimaging, neurophysiology, clinical biochemistry, and molecular genetics. Further skills should be also obtained to establish research strategies to deal with unsolved problems.

Available programs:

Clinical conference　Thursday 11:00-12:15, 13:15-18:00
Joint case conference of Departments of Neurology, Neurosurgery and Neuropsychiatry　Second Wednesday 18:30-19:30
Research presentation　Monday of the 1st week 17:00-19:00
Epilepsy case conference　Tuesday of the 4th week 19:00-20:00
Research conference of mental disorders　as occasion demands

Lab

Goals/Outline:
　The research goal is to investigate the neural mechanisms of mental disorders through the studies of clinical cases and experimental animal models. We will use the up-to-date techniques of the molecular biology, molecular genetics, neuroimaging, and neurophysiology to understand the etiology and pathophysiology of those illnesses and cognitive and behavioral dysfunctions at the molecular level. The final goal will be the development of novel diagnostic methods, treatment and prevention for the diseases.

Available programs:

Ask the corresponding person.

7. Grading System

Evaluation will be based on the research progress reports and presentation, paper publication in the research journals, and presentation at the national and international conferences.

8. Prerequisite Reading

1) Required to read through the text and the handout-pirnting materials beforehand provided, 2) Prerequisite additional preparation will be in advance informed.

9. Reference Materials

1) Kaplan & Sadock's Comprehensive Textbook of Psychiatry, 9th ed. Benjamin J. Sadock & Birginia A. Sadock (eds). Lippincott Williams & Wilkins.　(electoronic edition) 2009
2) Lewis's Child and Adolescent Psychiatry: A Comprehensive Textbook, 4th ed. André Martin & Fred R.Volkmar (eds). Lippincott Williams & Wilkins. (electoronic edition)　2007
3) Molecular Neuropharmacology, 2nd ed. Eric J. Nestler, Steven E. Hyman, and Robert C. Malenka (eds).　Mc Graw Hill Medical　2008

10. Important Course Requirements

None

11. Availability in English

Many of the lectures and discussion will be done in English. Interprtetation is available in daily basis.

12. Office Hour

Contact person: Toru Nishikawa　TEL　5803-5237　E-mail　tnis.psyc@tmd.ac.jp

13. Note(s) to students

Neurosurgery

Lecture	(code:	7 3 4 1	1st year	:6units)
Practice	(code:	7 3 4 2	1st～2nd year	:4units)
Lab	(code:	7 3 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Taketoshi Maehara Associate Professor: Tadashi Nariai
Contact person: Taketoshi Maehara Email: maehara.nsrg@tmd.ac.jp

2. Classroom/Lab

Ask the instructors before the class start.

3. Course Purpose and Outline

To acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the central nervous system and spinal cord, and to nurture the mind of exploration.

4. Course Objective(s)

To acquire the proper knowledge for diagnosis of neurological disease and for neurosurgical treatment.
To conduct experiments using novel research methods and give the solution to the clinical and basic problem in neuroscience field.

5. Format

Small group (～10 students) is favorable.
Talk & discussion style.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline
There are various attracting subjects in the field of clinical or basic research. It is essential to acquire the sufficient knowledge and insight into the pathological conditions as well as normal functions of the central nervous system and spinal cord, which will directly benefit for the improvement of clinical results. Main educational purpose of neurosurgery in the graduate course is to provide students opportunity to acquire the proper technique as well as the broad knowledge, and to nurture the mind of exploration.

Available programs:

Lecture:Tuesday and Thursday 8:00-10:00
Special Lecture: as required
Semminar: as required
Journal Club: Friday 8:00-8:30

Practice

Goals/outline
To acquire the proper knowledge for diagnosis of neurological disease and for neurosurgical treatment. Students will have the experience of various methods for the evaluation of neurological disorder as neurological exam, basic of neuro-imaging, physiological and molecular biological methods.

Available programs:

Meet with patients: Tuesday and Thursday 8:15-10:30
Clinical conference: Tuesday 15:30-16:00
Joint conference: 2nd Wednesday 18:30-20:00
neuro-pathology joint conference: 2nd Monday 18:30-20:00
Pituitary tumor conference: as required
EEG conference: every Thursday 17:30-18:30
Stroke conference 1st and 3rd Tuesday 18:00-19:00

Lab

Goals/outline
The main purpose of Lab study is to give the solution to the clinical and basic problem in neuroscience field, by using proper methods of physiological, biochemical, molecular-biological, and neuroimaging techniques.

Available programs:

Join Lab team: as required
Animal experiment course: as required
Cell biology course: as required

7. Grading System

By students' attendance rate, oral presentation.

8. Prerequisite Reading

Ask the instructors before the class start.

9. Reference Materials

Ask the instructors before the class start.

10. Important Course Requirements

none

11. Availability in English

Aveilable

12. Office Hour

Please email the Office of professor, Taketoshi Maehara at maehara.nsrg@tmd.ac.jp

13. Note(s) to students

Journal club & Meet with patients: maximum of 10 students
Join Lab team: maximum of 5 students.

Endovascular Surgery

Lecture	(code: 7 3 5 1	1st year	:6units)
Practice	(code: 7 3 5 2	1st～2nd year	:4units)
Lab	(code: 7 3 5 3	2nd～3rd year	:8units)

1. Instructor(s)

Shigeru Nemoto (professor, director)　Yoshikazu Yoshino (associate professor),
Kazunori Miki (assistant professor)
Contact person: Shigeru Nemoto　E-mail nemoto.evs@tmd.ac.jp

2. Classroom/Lab

conference room at 20F of MD tower

3. Course Purpose and Outline

Main educational purpose of Endovascular Surgery in the graduate course is to provide students the proper technique as well as the basic knowledge of neuroendovascular surgery.

4. Course Objective(s)

Course objects of Endovascular Surgery in the graduate course is to acquire the proper technique as well as the basic knowledge of neuroendovascular surgery.

5. Format

Few members each group.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Integrated lectures on anatomy, physiology, pathology, neurology with regard to endovascular surgery are performed. Clinical neuroscience (peripheral neuropathy, cerebrovascular disease, brain tumors etc) are also included.

Available programs:

Lecture	at any occasion
Special Lecture	at any occasion
Seminar	at any occasion
Journal Club	once a week
Conference	endovascular conference (Tokyo Seminar of Neuro-Endovascular Therapy for Stroke) once a year

Practice

Goals/Outline:
In each clinical case diagnostic imaging program is made for proper diagnosis and treatment. Interpretation of MRI, CT, SPECT and angiography findings are made at daily conference.
Technical learning of angiography is obtained at angio-suite.

Available programs:

Clinical round	every day 17:00-18:00
Stroke conference	every Tuesday 18:00-19:00
Combined neuroscience conference	every month (second Tuesday) 18:30-20:00

Lab

Goals/Outline:
Hemodynamic influence caused by endovascular devices are studied using computerized 3 dimension analysis of fluid hemodynamics.
To obtain catheterization and endovascular technique animal model and virtual simulator training are used.

Available programs:

flow study program
simulator training program at skills lab (on plan)
animal model training program (collaboration program with Jichi Medical University)

7. Grading System

Attending the lecture and practice and oral exam.

8. Prerequisite Reading

Student should learned basic knowledge of brain anatomy and neurology.

9. Reference Materials

Surgical Neuroangiography 1-3 (Springer)

10. Important Course Requirements

Nothing in particular.

11. Availability in English

Lecture in English is not planned.

12. Office Hour

We are available from Monday to Friday, 9:00 a.m. to 5:00 p.m.

13. Note(s) to students

Due to clinical services for patients, members are limited.

NCNP Brain Physiology and Pathology

Lecture	(code: ９０１１	1st year	:6units)
Practice	(code: ９０１２	1st～2nd year	:4units)
Lab	(code: ９０１３	2nd～3rd year	:8units)

1. Instructor(s)

Professor and Chairman Mikio Hoshino
Professor Yu-ichi Goto, Hiroshi Kunugi, Manabu Honda, Noritaka Ichinohe
Associate Professor Yoshitaka Nagai

2. Classroom/Lab

Ask professors for details.

3. Course Purpose and Outline

The nervous system is a very fine and complex organ to elicit the higher brain function and its malfunction causes a variety of neurological and psychiatric disorders in humans. In this lecture, students learn the structure, development and function of the normal nervous and muscle systems as well as pathology of developmental disorders, psychiatric disorders, neurological diseases and muscle diseases. Students also study the latest progress of advanced remedy for neuromuscular diseases. The lecture is held at NCNP (National Center of Neurology and Psychiatry).

4. Course Objective(s)

To know the basic structure and the developmental machinery of the nervous system of mammals including humans.To understand the pathology of some neuropsyichiatric diseases.

5. Format

The size of the class is small. Each student is supervised by a senior scientist.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
First, students learn the basic structure of the nervous system and the developmental machinery for the brain. Then, studensts study the pathology of neuropsychiatric disorders. They also learn recent progress of diagnosis and treatment for neuropsychiatric diseases.

Available programs:

Lecture Every Tuseday 16:00 - 17:00

Practice

Goals/Outline:
Students should learn the structure, development and function of the nervous and muscle systems as well as experimental skills required for their research. Each member should give a talk at Journal Club and Research Progress. Advices to develop members' presentation skills will be given.

Available programs:

Conference As needed
Journal Club Once a week
Research Progress As needed

Lab

Goals/Outline:
Our goal is to elucidate the molecular machinery underlying physiology and pathology of the nervous and muscle systems, which contributes to diagnosis and treatment of psychiatric, neurological and muscle diseases.

Available programs:

7. Grading System

We evaluate students generally based on progress reports on their studies and presentations at meetings in addition to attendance at lectures, practices, experiments and papers.

8. Prerequisite Reading

Students are expected to have basic knowledge of cell biology, brain science, and developmental biology.

9. Reference Materials

Essential Cell Biology (Alberts et al), Developmental Biology (Gilbert), Principle of Neural Science (Kandel)

10. Important Course Requirements

Students should do their best in this course.

11. Availability in English

Available

12. Office Hour

9:00 ~ 18:00

13. Note(s) to students

NCNP Homepage http://www.ncnp.go.jp/
National Institute of Neuroscience, NCNP Homepage http://www.ncnp.go.jp/nin/

Immune Regulation

Lecture	(code:	7 3 6 1	1st year	:6units)
Practice	(code:	7 3 6 2	1st～2nd year	:4units)
Lab	(code:	7 3 6 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Hajime KARASUYAMA, Lecturer: Yoshinori Yamanishi
Research Associates: Soichiro YOSHIKAWA, Shingo SATO
Contact person: Hajime KARASUYAMA E-mail: karasuyama.mbch@tmd.ac.jp

2. Classroom/Lab

To be announced

3. Course Purpose and Outline

The aim of this course is to understand how the immune system is organized and regulated to protect our body from the attack of pathogens, and to explore the molecular mechanisms underlying immune-related disorders, including allergy, autoimmune diseases, cancers, and chronic infections.

4. Course Objective(s)

Students gain an understanding of basic aspects of the structure and functions of the immune system and describe the applied aspects of immunology such as defense mechanism, allergy and autoimmunity.

5. Format

In a small group, with extensive discussion and bench works.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Lectures are given regarding the front line researches on molecular mechanisms underlying the development and activation of immune cells as well as their functions in vivo. In particular, lectures focus on the latest topics about the roles of basophils in protective immunity and allergic reactions, the engineered animal models of allergy, and the in vivo imaging of allergic reaction.

Available programs:

Special Lecture: as required
Journal Club: weekly
Progress meeting: weekly

Practice

Goals/Outline:
Access to and analysis of the database related to immunology, including DNA and protein sequences, and their 3D-structure.

Available programs:

Lab

Goals/Outline:
-Analyze the molecules involved in the differentiation, activation and migration of basophils in vitro and in vivo by using biochemical and genetic approaches.
-Establish engineered animal models of allergic disorders, and understand the cellular and molecular mechanism underlying the diseases, leading to the development of novel strategies for prevention and treatment of the diseases.

Available programs:

7. Grading System

Evaluating the planning of experiments, the progress in the planned experiments, the presentation of data in the progress meeting, and the discussion during lectures and practice.

8. Prerequisite Reading

Start reading any chapter of your interest in the textbooks listed below.

9. Reference Materials

1. Immunobiology 8th Edition (2011),Garland Science
2. Cellular and Molecular Immunology 8th Edition (2014), Saunders

10. Important Course Requirements

None

11. Availability in English

On demand

12. Office Hour

Contact first via e-mail (karasuyama.mbch@tmd.ac.jp)

13. Note(s) to students

None

Molecular Virology

Lecture	(code: 7371	1st year	:6units)
Practice	(code: 7372	1st～2nd year	:4units)
Lab	(code: 7373	2nd～3rd year	:8units)

1. Instructor(s)

Shoji Yamaoka, Professor; Hiroaki Takeuchi, Assistant Professor; Yasunori Saitoh, Assistant Professor; Takeshi Yoshida, Assistant Professor.
Contact person: Shoji Yamaoka E-mail: shojmmb@tmd.ac.jp

2. Classroom/Lab

On the 17th floor of M&D Tower

3. Course Purpose and Outline

To learn general knowledge of virology and experimental techniques.

4. Course Objective(s)

To understand the virological research and analyze the experimental results for reaching the conclusion.

5. Format

No more than 10 students will be allowed to join the lectures so that students are encouraged to join discussion.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Learn the latest progress in the basic and clinical research of virology from the molecular and immunological view points.

Available programs:
Lecture not fixed.
Special Lecture not fixed.
Journal Club Every Tuesday, from 12:00.
Conference Every Saturday, from 10:30.

Practice

Goals/Outline:
Understand experimental procedures for virology, bacteriology, immunology and molecular cell biology to prepare research article.

Available programs:

not fixed.

Lab

Goals/Outline:
Learn and acquire experimental procedures and techniques. Special attention will be paid to handling pathogens. Evaluate experimental results and plan new experiments.

Available programs:

not fixed.

7. Grading System

Students will be evaluated comprehensively on the basis of his/her participation in discussion, practice and experiments as well as research outcome, presentation and involvement in research meetings.

8. Prerequisite Reading

Reading the Journal Club paper in advance, acquiring the safe and accurate procedures before starting infection experiments.

9. Reference Materials

Fields Virology, Medical Microbiology and Infection at a Glance

10. Important Course Requirements

Nothing particular

11. Availability in English

Journal club in English.

12. Office Hour

from 9 AM to 18 PM.

13. Note(s) to students

The number of students joining the journal club or conference will be limited to 10.

Immunotherapeutics

Lecture	(code:	7 3 8 1	1st year	:6units)
Practice	(code:	7 3 8 2	1st～2nd year	:4units)
Lab	(code:	7 3 8 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Mari KANNAGI
Associate Professor: Takao, MASUDA
Asistant Professor: Atsuhiko, HASEGAWA ・ Yoshiko, Nagano
(Contact person: M. Kannagi, E-mail kann.impt@tmd.ac.jp)

2. Classroom/Lab

Office and laboratory at the M & D tower 17 th floor.

3. Course Purpose and Outline

Our research area is in between clinical and basic science, involving immunology, microbiology, and molecular biology. We participate in education for undergraduate medical students in basic immunology and a part of clinical immunology. For graduate students, we provide opportunities to research mechanisms of infectious diseases and develop immunological therapeutics.

4. Course Objective(s)

We investigate the disease mechanisms of human retroviral infection, such as AIDS caused by human immunodeficiency virus type 1 (HIV-1) and adult T-cell leukemia (ATL) caused by human T-cell leukemia virus type I (HTLV-I). These diseases are not simply explained by the direct pathogenic effects of the viruses, but influenced by a complex interplay between viruses and the host immune system. The aim of our research is the understanding disease mechanisms and the development of prophylactic and therapeutic strategies in these viruses infection. In order to conduct experiments of this area, students will be trained for tissue culture, immunological methods, molecular biological methods, and handling infectious materials and animals.

5. Format

Personal instruction by the supervisor, and total discussion at a seminar.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

【Outline】 To understand disease mechanisms and develop new therapies of persistent viral infection, we focus on recently published papers in related areas including clinical science, immunology, microbiology, and molecular biology in the seminar. The seminar is mainly in English and all the students and stuffs in the laboratory study the paper with active discuss.

Available programs:

Seminars including journal club and progress report on every Monday and Wednesday (12:30-14:30).

Practice

【Outline】 We handle human materials that are infected with human retroviruses or other viruses. The students will be trained for handling biohazadous materials. Some of the students need skill to handle experimental animals (mice and rats). Other techniques required in our research area include cell and tissue culture, flow cytometry, PCR, immunoblotting, etc. The students will be trained for these skills.

Available programs:

1. Analysis of immunological risks for ATL development in HTLV-I-carriers.
2. Development of anti-tumor vaccine using experimental animal model for ATL.
3. Immunological and molecular mechanism of HTLV-1 induced leukemogenesis.
4. Molecular mechanism of HIV replication especially related to HIV-1 integrase.
5. Immunological suppressive mechanisms on HIV-1 replication.

Lab

【Outline】We have the P1, P2 and P3 facilities in our laboratory. The flowcytometer is placed in the P2 facility so that the clinical materials can be analyzed immediately. The infectious materials are manipulated inside the safety cabinets in the P2 and P3. We also run regular molecular cloning, quantitative PCR, immunoblot analyses in a P1 area. The animal experiments will be performed in the central experimental animal center.

7. Grading System

Evaluation will be made based on the attendance and performance at the seminar and practice.

8. Prerequisite Reading

Basic immunological knowledge is required.

9. Reference Materials

http://www.tmd.ac.jp/english/faculties/graduate_school/index.html

10. Important Course Requirements

The students make presentation on their study periodically in seminars.

11. Availability in English

The seminar is performed mainly in English.

12. Office Hour

9:00-17:00

13. Note(s) to students

Cellular and Environmental Biology

Lecture	(code:	７３９１	1st year	:6units)
Practice	(code:	７３９２	1st～2nd year	:4units)
Lab	(code:	７３９３	2nd～3rd year	:8units)

1. Instructor(s)

MASAYUKI HARA, Ph.D.
Associate Professor
Contact person: Masayuki Hara　　E-mail　mhara.ric@tmd.ac.jp

2. Classroom/Lab

It is mainly performed in the department.

3. Course Purpose and Outline

The purpose of this course is to develop the ability to perform the following. 1. Find out problems in an environmental variation of a living organism. 2. Contrive the experimental ways of coping for the problems solving. 3. Prove the validity of the way. 4. Evaluate the results correctly.

4. Course Objective(s)

The student of this course can find out his/her own task from the problems in an environmental variation of a living organism, contrive the experimental ways of coping for the task, prove the validity of the way, and evaluate the results correctly.

5. Format

It is performed in an individual or a seminar form for few students.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The organism has been influenced by the environment, has been adapted for the environment, has formed the environment, and has evolved. The organism exists as a part of earth environment, and it is thought that each structure and function of an organism is necessary for the survival plan against the environment. The interaction of each cell in a multicellular organism and the microenvironment on which it was put is not exceptional including the process of differentiation. In order to understand the response and adaptation of an organism (cell) against an environmental alteration, the interaction mechanisms are explained.

Available programs:

Lecture　Every Monday between May and June 13:00-14:30
Journal Club　Every Monday 17:00-18:00

Practice

Goals/Outline:
In advancing a study, we discuss about the following; (1) examination of the related paper, and extraction of controversial points, (2) evaluation against the performed experimental procedure, (3) reliability of the experimental results, and (4) concluded points. Furthermore, we plan an experimental design about the new direction drawn from the discussion, and examine the validity.

Available programs:

Research Conference　Every Friday 17:00-18:00

Lab

Goals/Outline:
In this department, the experimental approaches from biochemistry, molecular biology, and cell biology are mainly performed. Therefore, these procedures must enough become skilled, simultaneously must be understood about the principle.

Available programs:

Participation in a research group　Anytime

7. Grading System

It is performed based on the situation of attendance to lectures, practice, and experiments (80%), and the situation of presentation to academic meeting and/or journal about the details of your research (20%).

8. Prerequisite Reading

None

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

Lectures are mostly held in Japanese.

12. Office Hour

Please contact to the abobe E-mail address, if necessary.

13. Note(s) to students

None

Biodefense Research

Lecture	(code:	７４０１	1st year	:6units)
Practice	(code:	７４０２	1st～2nd year	:4units)
Lab	(code:	７４０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Toshiaki Ohteki, Junior Associate Professor: Nobuyuki Onai, Assistant Professor: Hiroyuki Tezuka
Contact person: Toshiaki Ohteki E-mail: ohteki.bre@mri.tmd.ac.jp

2. Classroom/Lab

To be announced upon inquiry.

3. Course Purpose and Outline

The aim of this course is to understandthe the molecular basis of induction and failure of homeostasis by focusing on immune cells, tissue stem cells, and their functional interplay in the living body.

4. Course Objective(s)

Students should be able to understand differentiation and function of immune cells and tissue stem cells, and their abnormalities as possible causes of disease development.

5. Format

Small group or individual training/lesson will be given.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Immune cells and tissue stem cells are essential for the maintenance of homeostasis in the body by eradicating invading pathogens and regenerating tissue cells, respectively. Based on the background, this course deal with immune cells playing a role in the host defense and tissue stem cells playing a role in the tissue regeneration, and introduce up-to-date information on differentiation and function of these cells and related disorders.

Available programs:

Special Lecture: as required
Seminar: once a year
Journal Club: weekly

Practice

Goals/Outline:
This course deal with the latest research papers related to immunology and tissue stem cell biology. Students are expected and discuss the novelty and points remaining unsolved in these papers and the data weekly presented by themselves with supervisors in terms of their technical accuracy, immunological meaning, and future experimental design.

Available programs:

Progress Meeting: weekly

Lab

Goals/Outline:
Students are expected to learn the basic techniques to prepare immune cells and tissue stem cells from various tissues of normal, transgenic, and gene-targeting mice, and manipulate differentiation and function of these cells ex vivo and in vivo.

Available programs:

Experimental course: 10:00–17:00. Details will be announced upon participation.

7. Grading System

Evaluating based on attendance, research reports, and discussion status at the course.

8. Prerequisite Reading

Basic understanding of immunology and stem cell biology is required before attending this course.

9. Reference Materials

Janeway's Immunobiology 8th edition

10. Important Course Requirements

None

11. Availability in English

Upon request

12. Office Hour

Please contact via e-mail to Professor Ohteki (ohteki.bre@mri.tmd.ac.jp).

13. Note(s) to students

None

Pathological Cell Biology

Lecture	(code:	７４１１	1st year	:6units)
Practice	(code:	７４１２	1st～2nd year	:4units)
Lab	(code:	７４１３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Shigeomi Shimizu, Associate professor: Norio Shimizu, Assistant professor: Satoko Arakawa, Shinya Honda
Contact person: Pathological Cell Biology, Shigeomi Shimizu
E-mail shimizu.pcb@mri.tmd.ac.jp

2. Classroom/Lab

Venue is changed depending on the program. Please ask Instructors.

3. Course Purpose and Outline

Cell death and autophagy are fundamental cellular function to regulate various biological events. This course will provide an overview of molecular mechanisms and physiological and pathological roles of "Cell death" and "Autophagy". This course will also provide a comparative overview of virus life cycles and strategies viruses use to infect and replicate in hosts. We will discuss virus structure and classification and the molecular basis of viral reproduction,and virus-host interactions.

4. Course Objective(s)

The first object of the course is to understand biological significance of "Cell death" and "Autophagy". The second object of the course is to describe at the molecular level the replication strategies of representative DNA and RNA viruses and the effects of virus infection on cell growth control and survival.

5. Format

Lecture is done by individual guidance or seminar for a few students. Lab is done by individual guidance.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The lecture explains basic pathways of life phenomena causing variety of disease from the points of molecular, cellular, or organism level. Concretely, the lecture explains cell growth, cell death and cell division that are responsible for development, homeostasis, and disease based on these abnormalities. In virus treatment, we explained the molecular mechanisms of continuous infection of EB virus and HIV type I virus, and also explained the novel virus treatment.

Available programs:

Lecture: occasion demands
Special Lecture: occasion demands
Seminar: occasion demands

Practice

Goals/outline:
The practice examines research papers about physiological and pathlogical cell function, especially focusing cell death and autophagy. The practice also studies strategies in life science research by a research drafting for investigation of cell function and its abnormality, analyses of results and simulations of discussion.

Available programs:

Presentation once a week
Journal club once a week

Lab

Goals/outline:
The lab focuses on the acquisition of experimental techniques such as analyses of gene-targeting mice, analytic methods of cellular and organellar function. We also focus on the practice of research drafting. In virus treatment, we focus on the acquisition of techniques for detection of EB virus and HIV type I virus. Methods of cell culture for virus detection are also acquired.

Available programs:

7. Grading System

We evaluate the percentage of attendance at class. In some case, we set a report.

8. Prerequisite Reading

Students do not have to prepare for the class

9. Reference Materials

Molecular Biology of the Cell, Medical Virology

10. Important Course Requirements

nothing

11. Availability in English

none

12. Office Hour

Thursday 16:00 Contact; Shigeomi Shimizu, Pathological Cell Biology (E-mail shimizu.pcb@mri.tmd.ac.jp)

13. Note(s) to students

Pathological Biochemistry

Lecture	(code:	1st year	:6units)
Practice	(code:	1st～2nd year	:4units)
Lab	(code:	2nd～3rd year	:8units)

1. Instructor(s)

2. Classroom/Lab

Not offered

Immunology

Lecture	(code:	7 4 3 1	1st year	:6units)
Practice	(code:	7 4 3 2	1st～2nd year	:4units)
Lab	(code:	7 4 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Prof. Takeshi Tsubata E-mail tsubata.imm@mri.tmd.ac.jp

2. Classroom/Lab

Conference Room, MD tower 21 F, and Laboratory, MD tower 21 F

3. Course Purpose and Outline

Participants acquire the ability to address immune function and activity of immune cells based on the newest knowledge on immunology, and to conduct research on immune responses especially humoral immune responses through research projects,

4. Course Objective(s)

Participants acquire technical skills for immunoogical analysis such as flow cytometory, and ability to plan, conduct and present the research on immunology.

5. Format

Lecture, group discussion and experiments

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The aim of this course is to make the students understand basic mechanisms of immune responses and the methods for immune regulation.

Available programs:

Lecture to be announced
Special Lecture to be announced
Seminar to be announced

Practice

Goals/Outline:
The aim of this course is to make the students acquire ability to plan experiments on immunological studies, and address the data.

Available programs:

Group meeting Thursdays 9:30-11:00
Fridays 9:30-11:00

Lab

Goals/Outline:
The aim of this course is to make students acquire ability to experimentally address immune responses
Research projects are done to understand the immune system and to develop new methods for immune regulation.

Available programs:

7. Grading System

Attendance and quality of presentations

8. Prerequisite Reading

Bsic knbowledge on immunology and technical skills of biochemical analysis and molecular biology are required.

9. Reference Materials

Peter Parham "The Immune System" Garland Science

10. Important Course Requirements

none.

11. Availability in English

Available

12. Office Hour

Contact person: Takeshi Tsubata
E-mail tsubata.imm@mri.tmd.ac.jp

13. Note(s) to students

None.

Pediatrics and Developmental Biology

Lecture	(code:	7 4 4 1	1st year	:6units)
Practice	(code:	7 4 4 2	1st～2nd year	:4units)
Lab	(code:	7 4 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Tomohiro Morio , Associate Professor: Hirokazu Kanegane,
Specially Appointed Professor: Shozaburo Doi,
Specially Appointed Associate Professor: Kosuke Imai,
Junior Associate Professor: Masatoshi Takagi, Kenichi Kashimada,
Assistant Professor:Atsuko Taki, Erioko Tanaka, Susumu Hosokawa
Contact person: Tomohiro Morio E-mail tmorio.ped@tmd.ac.jp

2. Classroom/Lab

Conference room at the 8th floor (A8) of the Medical Hospital.
Postgraduate seminar room at the 9th floor of M&D tower.

3. Course Purpose and Outline

The final goal of our research is to elucidate the molecular mechanisms of intractable diseases in children and to develop novel measures to cure the diseases. We are interested in a broad spectrum of subjects in life science fields.

4. Course Objective(s)

Understanding of normal development of children, etiology of disease from a molecular cellular biological and genetical aspect .

5. Format

Seminar will be carried out in a small group. Each participant will be assigned to one project and will have instruction from the assigned tutor.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The students will learn normal development and organogenesis during fetus/infants/children, and the disorders caused by abnormal differentiation or development of the organs. The students will understand physiology in childhood and molecular pathogenesis of the childhood diseases.

Available programs:

Lecture	Pediatrics	As needed basis
Special Lecture	2-3 / year	As needed basis
Seminar	Monday Seminar	17:00-18:00 Monday
Journal Club	Journal Club	17:00-18:30 Tuesday
Conference	Morning Conference	8:00-8:45 Monday-Friday
	Hem/Onc Meeting	8:30-9:30 Wednesday
	Progress Report	18:30-19:30 Tuesday

Practice

Goals/Outline:
The students will acquire skills and knowledge to examine, evaluate, and treat the childhood patients, through lectures and practices.

Available programs:

Morning Conference	8:00-8:45 Monday-Friday
Clinical Round	16:30-17:30 Monday
	14:00-16:00 Wednesday
Pediatric Hematology/Oncology/Immunology	8:45-9:45 Wednesday
Pediatric Nephrology	19:00-21:00 the 2nd Thursday of the month
Pediatric Cardiology	19:00-21:00 the 3rd Friday of the month
Pediatric Neurorogy	19:00-21:00 the 4th Tuesday of the month
Pediatric Endocrinology	18:30-20:30 the 1th Friday of the month
Neonatology	19:30-21:00 the 4th Friday of the month

Lab

Goals/Outline:
The students will acquire the basic knowledge and skills in cellular biology, molecular biology, cellular morphology, and physiology in the following programs.

Available programs:

(The student will be assigned to one of the following programs):
#1 Pediatric Hematology/Oncology
Keywords: Childhood malignancy, DNA damage response, Cell cycle checkpoint, Hematopoietic stem cells,
#2 Pediatric Immunology
Keywords: Primary Immunodeficiency, B cell development, Class switch recombination, Protein & Gene therapy
#3 Pediatric Cardioangiology
Keywords: Pulmonary hypertension, Pulmonary vascular disorders, Electrophysiology
#4 Pediatric Neurology
Keywords: DNA damage response and neural degeneration, Sleep disorder
#5 Neonatology
Keywords: Periventricular leukomalacia, Bronchopulmonary dysplasia, neonatal vascular system
#6 Endocrinolofy
Keywords: Sexual differentiation, adrenal function

7. Grading System

Grading will be done by assessing knowledge, laboratory performance, ability to design experiments, skills of presentation and pretsentation at the scientifical meeting,

8. Prerequisite Reading

knowlesg about basic pediatrics and molecular cellular biology.

9. Reference Materials

Nelson Text book of Pediatrics, ELSEVIER
Molecular Biology of THE CELL, Newton Press
Cellular and Molecuar Immunology, ELSEVIER

10. Important Course Requirements

Nothing

11. Availability in English

Avialable upon a request

12. Office Hour

9am-5pm

13. Note(s) to students

Guidance and instruction can be done in English.

Rheumatology

Lecture	(code:	7 4 5 1	1st year	:6units)
Practice	(code:	7 4 5 2	1st～2nd year	:4units)
Lab	(code:	7 4 5 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Hitoshi Kohsaka, M.D., Ph.D.
Contact person: Hitoshi Kohsaka, M.D., Ph.D. E-mail kohsaka.rheu@tmd.ac.jp

2. Classroom/Lab

M&D Tower 13th floor

3. Course Purpose and Outline

The objectives of this program are to gain an accurate understanding of molecular and cellular pathology and therapy of rheumatic diseases, and to learn about methods to resolve various problems in clinical practice.

4. Course Objective(s)

The goal of this program is to acquire the ability to plan and conduct research that resolves issues in relation to diagnosis and treatment of rheumatic diseases.

5. Format

Small group meeting

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Understanding molecular and cellular pathology and treatment of rheumatic diseases

Available programs:

Journal Club every other Thursday evening
Conference every Thursday evening

Practice

Goals/Outline:
Familiarizing how pathology of rheumatic diseases is investigated for development of new treatments.

Available programs:

Participation in research studies and clinical studies.

Lab

Goals/Outline:
Investigating pathology of rheumatic diseases for development of new treatments.

Available programs:

Participation in research studies and clinical studies.

7. Grading System

Comprehensive grading based on the participation in the research program and discussion, study progress, and conference presentation.

8. Prerequisite Reading

It is preferable for students to acquire the general knowledge of rheumatic diseases.

9. Reference Materials

Standard medical textbooks

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Contact person: Hitoshi Kohsaka, M.D., Ph.D.　　E-mail　kohsaka.rheu@tmd.ac.jp

13. Note(s) to students

10 students at maximum

Dermatology

Lecture	(code:	7461	1st year	:6units)
Practice	(code:	7462	1st～2nd year	:4units)
Lab	(code:	7463	2nd～3rd year	:8units)

1. Instructor(s)

Professor and Chairman: Hiroo Yokozeki
Assistant Professor: Ken Igawa, Kaoru Takayama , Takeshi Namiki
Contact person: Ken Igawa E-mail: 3064derm@tmd.ac.jp

2. Classroom/Lab

N/A

3. Course Purpose and Outline

To study the pathology, Imuunolodermatology, Physiology of the skin, To study the mechanism of skin diseases

4. Course Objective(s)

To understand the pathogenesis of skin diseases

5. Format

Conducting research as a member of the laboratory. A small group meeting will be held periodically to have discussions with instructors.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To understand a structure, function, imuunological roles, biological roles of the skin
To understand the pathophysiological mechanism of skin diseases

Available programs:

Lecture April to July 12 times rectures
Special Lecture July, December: Yushima Danwa kai
April: skin allergy study recture
Seminar Thursday PM3:00-5:00
Journal Club Thursday PM 5:00-5:50
Conference Research conference: Thursday PM 5:30-6:00

Practice

Goals/Outline:
To practice how to make a diagnosis of skin diseases by clinical and pathological examination.

Available programs:

Clinical conference every Thursday 1:30-6:00

Lab

Goals/Outline:
General:
Etiological and immunological mechanisms of cutaneous allergic responses.
Establishment of a potent therapeutic approach for treatment-resistant allergic skin diseases.
Research projects:
1. Biological significance of prostaglandin D2 and its receptors in skin inflammation.
2. Mechanisms of eosinophil and basophil infiltration to the skin.
3. Biosynthesis of prostanoids in basophils and contribution to skin diseases.
4. Therapeutic approach for atopic dermatitis with STAT6 siRNA.
5. Stable form of galectin-9 as a novel therapeutic tool for psoriasis.
6. Analysis of scratching behavior in mouse model of skin inflammation.
7. Development of potent therapeutic tools for a mouse model of angiosarcoma
8. Analysis of skin diseases by using iPS cells induced epidermal sheets

Available programs:

N/A

7. Grading System

Total grading score is to be assessed based on one's enthusiasm for science, experimental skills, and scientific quality of manuscript submitted for publication.

8. Prerequisite Reading

To understand the immunnology and pathology

9. Reference Materials

Lever's Histopathology of the skin, David E Elder, 2005. Fitzpatrick's Dermatology in general Medicine, IM Freedberg et al, 2003

10. Important Course Requirements

11. Availability in English

It is possible to study dermatology in english

12. Office Hour

Hiroo Yokozeki, M.D.,Professor E-mail: 3064derm@tmd.ac.jp

13. Note(s) to students

NCCHD Child Health and Development

Lecture	(code:	９０３１	1st year	:6units)
Practice	(code:	９０３２	1st～2nd year	:4units)
Lab	(code:	９０３３	2nd～3rd year	:8units)

1. Instructor(s)

Dr. Hidenori Akutsu
Dr. Masashi Onodera
Dr. Maki Fukami
Dr. Kenichiro Hata
Dr. Shuji Takada
Dr. Junji Yamauchi

2. Classroom/Lab

National Center for Child Health and Development, seminar rooms (2nd, 6th, 7th, 8th floor)

3. Course Purpose and Outline

Our course purpose is to educate the developmental process of human life from the viewpoints of latest molecular biology and genetics. NCCHD Child Health and Development is to study the health and development of infants, children, adolescents, and young adults thorough basic science education and innovative research. We support to learn the Child Health Care and Development through educating and training by experts.

4. Course Objective(s)

To acquire practical knowledge based on the scientific and medical viewpoints encompassing human developmental biology through gametic differentiation.

5. Format

Lectures are setting in small group discussion style

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The goal of this course is to learn the developmental process of human life from the viewpoints of latest molecular biology and genetics. Medical science for child health and development is the study to comprehensively grasp various health problems related to “human life cycle” to begin with the fertilization and to continue to the next generation through generation and development. Students of this course are required to understand a role and a function of medical care for child health and development, to acquire ability to handle such health problems and support relevant person with specialized theory and technique.

Available programs:

Practice

Goals/Outline:
Students report progress of each study and discuss research plan each other. When someone derives a certain conclusion from the series of experimental results, those findings will be reported in national and international academic meetings or published in an academic journal.

Available programs:

Lab

Goals/Outline:
[Hidenori Akutsu] Exploring molecular mechanism for acquisition of zygote totipotency, epigenetic reprogramming and pluripotency in stem cells. Application studies for reproductive medicine and regenerative medicine.
[Shuji Takada] Identification of target molecules in severe diseases and establishment of disease model mice by studying molecular mechanisms of genomic imprinting, gametogenesis and sexual differentiation.
[Maki Fukami] Elucidation of genetic abnormality in congenital severe metabolic diseases using advanced genetic analysis
[Masashi Onodera] Studying for cellular model in human severe disease by advancing flow cytometry.
[Junji Yamauchi] Elucidation for neurological disease mechanism and target molecules using molecular biology and tissue engineering.
[Kenichiro Hata] Elucidating for molecular mechanism of perinatal abnormality using system biology.

Available programs:

7. Grading System

Your attendance to lectures and lab works including your commitments to presentation and publishing will affect your final grade of the course. Conducting your research and attendance to lectures: 70%, Presentation and/or publishing your works: 30%

8. Prerequisite Reading

It is recommended that you read through Developmental Biology, Scott F. Gilbert. Sinauer Associates Inc.

9. Reference Materials

Developmental Biology, Scott F. Gilbert. Sinauer Associates Inc.

10. Important Course Requirements

Lectures, seminars and meetings are carried out in Japanese, however discussion with English speakers is performed in English.

11. Availability in English

Available

12. Office Hour

Akutsu, Hidenori：akutsu-h@ncchd.go.jp, Takada, Shuji：takada-s@ncchd.go.jp, Fukami, Maki：fukami-m@ncchd.go.jp, :
Onodera, Masafumi: onodera-m@ncchd.go.jp, Yamauchi, Junji：yamauchi-j@ncchd.go.jp, Hata, Kenichiro：hata-k@ncchd.go.jp

13. Note(s) to students

The documents such as English general remarks are distributed as needed.

Human Pathology

Lecture	(code:	7 4 7 1	1st year	:6units)
Practice	(code:	7 4 7 2	1st～2nd year	:4units)
Lab	(code:	7 4 7 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor Yoshinobu EISHI

2. Classroom/Lab

Depending on the program. Confirm to lecturers before the program.

3. Course Purpose and Outline

Pathology is the logic of human disease in a broad sense, and is the scientific field for elucidation of pathogenesis, progression, and clinical outcome of human disease principally by the morphological analysis of human cells, tissues, and organs. Our courses contain the classes of both diagnostic pathology and scientific research. The diagnostic classes include a lot of clinicopathological conferences with clinicians. In the research classes, we hold practical training on the research techniques mainly using human tissue specimens.

4. Course Objective(s)

The objective of our course is to learn the skill of surgical pathology and to understand the role of pathologists in clinical medicine. Basic theory and research techniques of biology should be also learned in order to approach the research issues arising in routine pathological diagnosis.

5. Format

Discussion in a small group with histological slides and microscope when necessary.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Pathological autopsy practice:

The students learn the procedure of pathological autopsy, the observation of macroscopic and microscopic findings of lesions, preparation of autopsy reports, through the participation in pathological autopsies. In the process of the comparison between clinical and pathological findings, the students acquire the total knowledge about pathogenesis and progression of diseases.

Available programs:

Case control Tuesday 9:30 - 11:30
Macroscopic check Tuesday 14:30 - 15:00
CPC Tuesday 17:00 - 19:00

Surgical pathology practice

Participating in the routine pathological diagnosis of biopsied or surgically resected human specimens, the students learn the skill to make the pathological diagnosis depending on not only Japanese but also world-standardized classification of disease.

Available programs:

Case study in Pulmonology Wednesday 17:00 - 18:30
Case study in Breast Surgery 1st Monday 18:30 - 20:30
Case study in Neurosurgery 2nd Monday 18:30 - 20:30
Case study in Gynecology 3rd Monday 18:30 - 20:30
Case study in Dermatology 4th Monday 18:30 - 20:30
Surgical case meeting Tueseday 13:30-14:00

Research practice

The students learn the techniques necessary for pathological diagnosis, such as immunohistochemistry, in-situ hybridization, or polymerase-chain reaction, and so on. The students participate in the practical research activities on the elucidation of etiology and the development of novel methods in surgical pathology.

Available programs:

To be involved in research meeting on Thursday 18:00-20:00
A short training course for the methods listed below on 1st Friday 13:00-17:00.
1) Preparation of histological sections
2) Immunohistochemistry
3) DNA extraction from paraffin sections
4) In situ hybridization for paraffin sections
5) Real-time PCR including RT-PCR
6) Flow cytometry for lymphocytes
7) Double-colored immunofluorescence
8) Preparation of monoclonal antibodies for paraffin sections

7. Grading System

Submit summary for the journal club (at least 2 times) and clinic-pathological conference (at least 2 times) held in Tuesday

8. Prerequisite Reading

It is necessary to review a macroscopic anatomy and the microscopic organization science of each organ because knowledge of the organization science is indispensable to understand a pathological change in a disease.

9. Reference Materials

(1) Robbins & Cotran Pathologic Basis of Disease 9th ed. W B Saunders Co.
(2) Rosai and Ackerman's Surgical Pathology 10th ed. Mosby.

10. Important Course Requirements

Nothing

11. Availability in English

Partially

12. Office Hour

Professor Yoshinobu EISHI E-mail eishi.path@tmd.ac.jp

13. Note(s) to students

No limit for participants, but in a small group composed of five students or less.

Physiology and Cell Biology

Lecture	(code:	７４８１	1st year	:6units)
Practice	(code:	７４８２	1st～2nd year	:4units)
Lab	(code:	７４８３	2nd～3rd year	:8units)

1. Instructor(s)

Shu Takeda (Professor), Toru Fukuda (Assistant professor), Shingo Sato(Assistant professor), Hiroki Ochi(Assistant professor)

2. Classroom/Lab

TBA

3. Course Purpose and Outline

Recent progress in molecular biology and genetics advanced our understanding of molecular basis of physiological function and pathophysiological mechanisms of various diseases. Besides, signal transduction system using intercellular, intersystem, and inter-organ networks has been shown to be essential for whole body homeostatic function. In this lecture, we will discuss hierarchical regulatory system governing individual homeostasis.

4. Course Objective(s)

To join our research team and learn various experimental techniques including molecular biology, cellular biology, and physiology. To progress our research projects and improve our understanding of whole body homeostasis by inter-organ network system.

5. Format

Small group discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Recent progress in molecular biology and genetics advanced our understanding of molecular basis of physiological function and pathophysiological mechanisms of various diseases. Besides, signal transduction system using intercellular, intersystem, and inter-organ networks has been shown to be essential for whole body homeostatic function. In this lecture, we will discuss hierarchical regulatory system governing individual homeostasis.

Available programs:

Graduate School Seminar: TBA
Graduate School Special Seminar: TBA
Journal Club: Third Friday 12:00－13:30

Practice

Goals/Outline:
To understand the background of the research field and bring up relevant scientific questions. To develop scientific thinking with effective questions and learn the way of scientific presentation.

Available programs:

Lab meeting: Once weekly (TBA)

Lab

Goals/Outline:
You can Join our research team and learn various experimental techniques including molecular biology, cellular biology, and physiology.

Available programs:

You can participate in our research team anytime.

7. Grading System

You are evaluated based on your attendance rate for the lecture, practice, lab, and academic meetings, and your attitude for scientific research.

8. Prerequisite Reading

You are recommended to improve your knowledge about physiology, molecular biology, endocrinology, bone biology, and molecular oncology.

9. Reference Materials

N/A

10. Important Course Requirements

N/A

11. Availability in English

Available in some circumstances

12. Office Hour

Contact information: Shu Takeda, TEL: 03-5803-5158, E-mail:takeda.phy2@tmd.ac.jp

13. Note(s) to students

N/A

Molecular Cellular Cardiology

Lecture	(code:	７４９１	1st year	:6units)
Practice	(code:	７４９２	1st～2nd year	:4units)
Lab	(code:	７４９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Tetsushi Furukawa　　Assistant Professor Yusuke Ebana
Contact person: Tetsushi Furukawa, E-mail: t_furukawa.bip@mri.tmd.ac.jp

2. Classroom/Lab

It will be held in seminar room in M&D tower, which will be announced in time.

3. Course Purpose and Outline

The purpose of this course is to learn basic physiology, pharmacology, and molecular biology of cardiovascular system and cardiovascular diseases in taking into consideration to advance to the translational research.

4. Course Objective(s)

The goal of this course is to understand basic physiology, pharmacology, and molecular biology of cardiovascular system and cardiovascular diseases.

5. Format

In general, it will be held with few attendances. We will encourage question and discussion to promote interaction between lecturer and attendances.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
You will learn pathogenesis for cardiovascular diseases including fetal arrhythmias, sudden cardiac death, and gender difference through lecture and discussion. The goal is to obtain knowledge, with which you will proceed your own research project.

Available programs:

Lecture　every 2 weeks, Monday 15:00-16:30
Special Lecture　once per year
Seminar　once a week, every Friday 15:00-16:30
Journal Club　once a week, every Friday 17:00-19:00

Practice

Goals/Outline:
You will learn pathogenesis for cardiovascular diseases including fetal arrhythmias, sudden cardiac death, and gender difference through experiment and practice. The goal is to obtain technique, with which you will proceed your own research project.

Available programs:

Research conference once a week, every Tuesday 10:00-11:00

Lab

Goals/Outline:
Using multi-disciplinary approach including molecular, genetic, and electrophysiological techniques, we will study unproven important cardiovascular theme shown below.

Available programs:

Participation in a research group
(1) Personalized medicine for cardiac arrhythmias (especially atrial fibrillation and sudden death)
(2) Basic research for gender-specific medicine in cardiovascular diseases
(3) Use of human ES- and iPS-derived cardiomyocytes for arrhythmia research
-Screening system of drug effects and toxicities
-Establishment of diseased model cardiomyocytes
(4) State-of-art technology for arrhythmia researches
-Motion vector technology for cardiomyocyte function assay
-Basic research for 3-D simulator of cardiac electrical activity using super-computer

7. Grading System

It will be given on the status of attendance to discussion, seminar, and research conference, and on presentations and remarks. In addition, it will be given comprehensively also considering research content, attendance to research meetings, and presentation in meetings.

8. Prerequisite Reading

The basic knowledge in molecular biology, and hopefully in cardiac physiology and pharmacology is required.

9. Reference Materials

N/A

10. Important Course Requirements

Communication skill in English
Strong motivation to perform research
Cooperativity with other lab. members

11. Availability in English

Lecture on Monday and Seminar on Friday are held in English.

12. Office Hour

9:00-18:00

13. Note(s) to students

Molecular Medicine and Metabolism

Lecture	(code:	1st year	:6units)
Practice	(code:	1st～2nd year	:4units)
Lab	(code:	2nd～3rd year	:8units)

1. Instructor(s)

2. Classroom/Lab

Not offered

Stem Cell Regulation

Lecture	(code:	７５１１	1st year	:6units)
Practice	(code:	７５１２	1st～2nd year	:4units)
Lab	(code:	７５１３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Tetsuya Taga, Associate Professor Tetsushi Kagawa, and Associate Professor Ikuo Nobuhisa
Contact person: Prof. Tetsuya Taga E-mail: taga.scr@mri.tmd.ac.jp

2. Classroom/Lab

The venue should be confirmed by contacting instructors before attendance. It varies depending on the programs.

3. Course Purpose and Outline

The purpose of this course is to encourage students to comprehensively understand stem cells in normal and pathological conditions. Students will improve their abilities to independently study stem cell regulations and applications through education and training about origins, properties, and regulations of stem cells that function in tissue development, maintenance and regeneration. The course will especially focus on neural stem cells, hematopoetic stem cells, and cancer stem cells in view of cell-external cues from "niches" and cell-intrinsic cues such as epigenetic regulations.

4. Course Objective(s)

The objectives of this course are as follows: To help students absorb knowledge and research strategies that are necessary to understand and employ regulatory mechanisms of stem cell development, maintenance, and fate determinations, particularly in neural stem cells, hematopoetic stem cells, and cancer stem cells. To make students learn molecular biological, cell biological, and histological methods for conducting research projects. To develop students' skils to recognize problems by themselves, construct working hypotheses, design and perfrom experiments to solve them, properly discuss experimental results. and, report the summary of research in English.

5. Format

Programs are set up for a small number of students for more intense discussion and in-depth participation.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
This course will introduce to students the recent topics in the research field of stem cell regulation. Tissue stem cells possess potential to generate all cell types present in a given tissue. In order to understand tissue development and regeneration from the biological and clinical viewpoints, it is important to study the molecular regulation of stem cell maintenance and fate specification. Not only normal tissue stem cells, e.g. neural and hematopoietic stem cells on which we place particular focus, but also cancer stem cells will be discussed to consider the problem of cancer recurrence. We will refer to cell-extrinsic signals like growth factors in the niche and cell-intrinsic program such as epigenetic modifications as cell fate regulatory elements.

Available programs:

Research Meeting 14:00 ~ 15:30 or 15:00 ~ 16:30 on every Friday

Practice

Goals/outline:
In this course, students will learn the molecular basis of stem cell regulation in view of cell-extrinsic signals and cell intrinsic-programs during tissue development, maintenance, and regeneration from molecular to whole-body levels. Students will receive exposure to cutting edge concepts and research technologies, and study regulatory mechanisms in neural, hematopoietic and cancer stem cells from multiple viewpoints. With emphasis also on physiological and pathological conditions surrounding the stem cells, the course aims to improve student's understanding of stem cells.

Available programs:

Progress Report　16:00 ~ 19:00 on every Monday, 17:30 ~ 19:00 on every Tuesday
Workshop　15:30 ~ 17:00 or 16:30 ~ 18:00 on every Friday

Lab

Goals/Outline:
Each student will conduct independent research, under supervision of instructors, on regulatory mechanisms of either the neural, hematopoietic, and cancer stem cells. Other tissue stem cells can be tackled by consultation. Students are advised to design experiments regarding, for example, stem cell development, maintenance of multipotentiality, cell-fate specification, cell migration, maturation, maintenance, and regeneration. Through execution of such experiments, students shall understand general property of stem cells in both/either physiological and/or pathological conditions and obtain a hint for going into translational research.

Available programs:

Participation to the research groups　by consultation

7. Grading System

Grading will be undertaken based on lecture/practice/lab participation, performance, presentation, and lab work execution.

8. Prerequisite Reading

Students should read in advance literature on stem cell regulations. They should also possess the necessary skills to run Word, Excel, and PowerPoint, which are used in the Lectures and Practice.

9. Reference Materials

Molecular Biology of the Cell, fifth edition. Garland Science. 2008.
StemBook. Harvard Stem Cell Institute. 2008-. (http://www.ncbi.nlm.nih.gov/books/NBK27044/)

10. Important Course Requirements

Participants are required to study on a voluntarly basis.

11. Availability in English

Doctral course students must use English in presentations and discussions.

12. Office Hour

11:00 ~ 12:00 on every Monday (make an appointment by E-mail). Prof. Tetsuya Taga's E-mail address: taga.scr@mri.tmd.ac.jp

13. Note(s) to students

None.

Molecular Pharmacology

Lecture	(code:	7 5 2 1	1st year	:6units)
Practice	(code:	7 5 2 2	1st～2nd year	:4units)
Lab	(code:	7 5 2 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Masaki Noda, Associate Professor: Yoichi Ezura
Contact person: Masaki Noda in Molecular Pharmacology
Email: noda.mph@mri.tmd.ac.jp

2. Classroom/Lab

M&D tower 24th floor

3. Course Purpose and Outline

The calcium metabolism is an essential regulatory system whereby maintaining homeostasis in whole body. This course focuses on the understanding of molecular mechanisms in the organs that is associated with calcium metabolism, particularly bone.

4. Course Objective(s)

The goal of this course is to understand how calcium metabolism regulates homeostatic maintenance as well as interorganizational communications. The another objective of this course is to understand the transcriptional and posttranscriptional regulation that is associated with cellular function, particularly cell differentiation and proliferation, in the cells consisting the organs regulating systemic calcium homeostasis in the body.

5. Format

Seminar
Lecture
Presentation and discussion

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline:
Scientific bases for the research that contribute to the establishment of therapy and prevention for osteoporosis and the other calcium-related disorders will be provided. These bases are for elucidation of molecular mechanisms underlying regulation of calcium metabolism. Skeletal system is the largest storage site for calcium in a living body and its metabolism is controlled by a complexity of cell populations consisting of bone-forming osteoblasts and bone-resorbing osteoclasts as well as stromal cells and chondrocytes. In our department, we take molecular and cellular biological approaches to study (i) the mechanisms of regulation of the development, differentiation, and function of each group of these cells; (ii) interaction between cells, organs, and the cells and extracellular matrix molecules; (iii) biochemical and biological properties of extracellular matrix molecules and signaling molecules including cytokines and hormones. We aim at elucidating molecular pathology of the disease caused by dysfunction of calciumhomeostasis. We will also provide current information regarding the basis and application of this research on skeletal diseases.

Available programs:

Graduate lecture on occasion
Graduate special lecture on occasion

Practice

Goals/Outline:
To learn the function of molecules involved in calcium regulation through experiments and seminars. In addition to obtaining technical skills, practical training would be given to learn how to propose research plans, interpret results, and understand integrated research.

Available programs:

Graduate tutorial on occasion
Bone biology seminar on occasion
Graduate seminar 8:30~9:20 every Tuesday
Molecular biology seminar 8:30~9:20 every Friday
Research progress meeting 8:30~9:20 every Monday & Thursday

Lab

Goals/Outline:
Experiments to reveal function of molecules in an organism involved in regulation of calcium metabolism, molecular biological approach will be the base. In vivo and in vitro experiments using osteoblasts, osteoclasts, knockout mice, and transgenic mice will be performed.

Available programs:

Molecular pharmacology experiment
Cell biology experiment
Molecular biology experiment
Molecular embryology experiment

7. Grading System

Comprehensive evaluation

8. Prerequisite Reading

This course requires basic understanding and knowledge about molecular biology related to homeostasis as well as diseases and pathophysiology bases that are caused by impaired homeostasis.

9. Reference Materials

Mechanosensing Biology, Masaki Noda, p1-219, Springer, 2011
Principles of Bone Biology (Second Edition) Volume 1 and 2, 2002
骨のバイオロジー　野田政樹　実験医学バイオサイエンスシリーズ　1998

10. Important Course Requirements

Not applicable

11. Availability in English

Available

12. Office Hour

Masaki Noda
Professor
Department of Molecular Pharmacology
E-mail: noda.mph@mri.tmd.ac.jp

13. Note(s) to students

Molecular Cell Biology

Lecture	(code:	7 5 3 1	1st year	:6units)
Practice	(code:	7 5 3 2	1st～2nd year	:4units)
Lab	(code:	7 5 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Associate professor: Toshiyasu Goto
Professor: Hiroshi Shibuya
Contact person: Department of Molecular Cell Biology, Hiroshi Shibuya,
TEL 03-5803-4901
E-mail shibuya.mcb@mri.tmd.ac.jp

2. Classroom/Lab

Since the venue is depended on programs, please confirm the venue to the course instructor before classes.

3. Course Purpose and Outline

In vertebrates, morphogenesis and organogenesis are established by induction of various signal molecules. In addition, the collapse of these signalings are linked to the onset of disease. Our course purpose is the understanding of mechanisms of desease from the point of view of signaling network by various signal molecules.

4. Course Objective(s)

Our course objectives
1, the understanding of interaction between desease and signal traunsduction.
2, the learning how to proceed research and to write thesis in our field of study.
3, the training of researchers who have a better understanding of our field of study and apply to understand other fields os study in biology.

5. Format

Small group instruction is held as possible to allow students to participate frequently in discussions.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
This course explains the mechanisms of cellular function in morphogenesis and tissue genesis based on the signal transduction pathway.

Available programs:

Lecture as the occasion demands.
Special Lecture as the occasion demands.
Seminar as the occasion demands.
Journal Club Monday 10:00-12:00.

Practice

Goals/Outline:
This course focuses on the mechanisms of cellular function in morphogenesis and tissue genesis based on the signal transduction pathway. It contains preparation and discussion for reading and writing the related research papers.

Available programs:

Conference Friday 9:00-11:00
Discussion as the occasion demands.

Lab

Goals/Outline:
For understanding the mechanisms of cellular function in morphogenesis and tissue genesis based on the signal transduction pathway, graduate students have actual experiences about research planning, advanced technology and discussion of study.

Available programs:

Participation in research group as the occasion demands.
The experiments of Molecular Cell Biology 5 days / year 13:00-16:00
The outlines: 1) Analysis of gene expression at the level of nucleic acids and proteins.
2) Analysis of the interaction of signaling molecules.
3) Analysis of cell differentiation using the cell culture system.
4) Analysis of tissue sections by immunohistochemistry.

7. Grading System

The evaluation is based on the content in lecture, practice and research program. The participation (attendance) situation is also evaluated.

8. Prerequisite Reading

N/A

9. Reference Materials

N/A

10. Important Course Requirements

N/A

11. Availability in English

Available

12. Office Hour

Department of Molecular Cell Biology, Prof. Hiroshi Shibuya. TEL: 03-5803-4901. E-mail shibuya.mcb@mri.tmd.ac.jp

13. Note(s) to students

N/A

Epigenetics

Lecture	(code:	7551	1st year	:6units)
Practice	(code:	7552	1st～2nd year	:4units)
Lab	(code:	7553	2nd～3rd year	:8units)

1. Instructor(s)

Associate Prof. Takashi KOHDA
E-mail tkohda.epgn@mri.tmd.ac.jp

2. Classroom/Lab

Request detail information on dates and place

3. Course Purpose and Outline

Aim of this course is to acquire and establish the epigenetic viewpoint over the biological phenomena in contrast to the genetic view. The basic skill for epigeneitic research, such as DNA methylation analysis, should also be acquired.

4. Course Objective(s)

Understand the concept of epigenetics as the causality. Establish the reseach skill for basic epigeneome analysis.

5. Format

Lecture, Practice and Lab will be carried out with small-group lecture and guidance.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Both genetics and epigenetics are the basics of biology to understand higher-order life phenomena. Epigenetics explains how gene expression is regulated during development and growth coupled with gene regulatory network. Our goals are to understand the mechanism of mammalian development including genomic imprinting, and to evaluate the risk for newly developing regenerative technologies using somatic cloning and iPS cells in medical application.

Available programs:

Lecture Every Friday 17:00-18:00
Special Lecture Request detail information on dates and place

Practice

Goals/Outline:
Read published papers including classics to the latest one on epigenetics and discuss contents.

Available programs:

Seminar Request detail information on dates and place
Journal Club Every Monday 10:00-12:00
Conference Request detail information on dates and place

Lab

Goals/Outline:
・To get good skill for recombinant DNA experiment including DNA sequencing and DNA methylation analysis
・Production of iPS cells

Available programs:

Request detail information on dates and place

7. Grading System

Attendance (80 %), External presentation of the research (20 %).

8. Prerequisite Reading

Read through the textbook "Molecular Biology of the Cell".

9. Reference Materials

Molecular Biology of the Cell

10. Important Course Requirements

Nothing

11. Availability in English

yes

12. Office Hour

Every Monday 14:00-17:00

13. Note(s) to students

Contact before application due to the limitation of number of students.

Chronobiology

Lecture	(code:	7561	1st year	:6units)
Practice	(code:	7562	1st～2nd year	:4units)
Lab	(code:	7563	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor Jun Hirayama　　Assistant Professor Yoichi Asaoka
Contact person:Hiroshi Nishina　　E-mail　nishina.dbio@mri.tmd.ac.jp

2. Classroom/Lab

It will be held in seminar room in M&D tower, which will be announced in time.

3. Course Purpose and Outline

The class will introduce topics of the latest of biology and knowledge of basic medicine, which are helpful for the students' researches. Especially biological phenomena of a higher order observed in vertebrates and molecular mechanisms controlling them will be introduced.

4. Course Objective(s)

The objective of the course is to obtain knowledge of signal transduction, development, and circadian clock research fields.

5. Format

In general, it will be held with few attendances. We will encourage question and discussion to promote interaction between lecturer and attendances.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
You will learn signal transduction of murine and fish development through lecture and discussion. The goal is to obtain knowledge, with which you will proceed your own research project.

Available programs:

Lecture　TBA
Special Lecture　TBA
Seminar　TBA
Journal Club　once a week, every Thursday 10:00-12:00
Conference　once a week, every Thursday 10:00-12:00

Practice

Goals/Outline:
You will learn signal transduction of murine and fish development through experiment and practice. The goal is to obtain knowledge, with which you will proceed your own research project.

Available programs:

Lab

Goals/Outline:
Using multi-disciplinary approach including molecular and genetic techniques, we will study unproven important developmental theme shown below.

Available programs:

Participation in a research group
(1) Physiological roles of JNK signaling pathway
(2) Physiological roles of Hippo signaling pathway
(3) Mutations affecting liver development and function in Medaka, Oryzias Latipes

7. Grading System

It will be given depending on the research report and/or presentation in scientific meeting.

8. Prerequisite Reading

We encourage you to obtain knowledge and techniques of development,cellular biology, molecular biology, genetics and biochemistry on your own initiative.

9. Reference Materials

Molecular cell biology (Sixth Eedition) W.H. Freeman and Company

10. Important Course Requirements

Not applied

11. Availability in English

Available

12. Office Hour

13:00-17:00 on Monday, Tuesday and Wednesday.

13. Note(s) to students

Stem Cell Biology

Lecture	(code:	７５７１	1st year	:6units)
Practice	(code:	７５７２	1st～2nd year	:4units)
Lab	(code:	７５７３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Emi Nishimura, Assistant Professor Hiroyuki Matsumura
Contact person: Prof. Emi Nishimura　　TEL　5803-4651　　E-mail　nishscm@tmd.ac.jp

2. Classroom/Lab

To be announced by E-mail

3. Course Purpose and Outline

The purpose of this course is to provide students with opportunities to learn Stem Cell Biology and its clinical relavance.

4. Course Objective(s)

1) define the term "stem cell" and "tissue stem cells"　2) learn methodology for stem cell research 3) understand the mechanisms underlying tissue cell turnover and homeostasis 4) learn about diseases caused by stem cell defects 4) learn about clinical applications

5. Format

Seminar & Hans-on Lab

6. Course Description and Timetable

Recent topics in the field of stem cell biology and medicine will be presented and discussed with participants.
The exact schedule should be checked with the teacher in charge for the program.

Lecture

Goals/outline:
Our goal is to understand the mechanisms of tissue homeostasis driven by stem cell systems and to apply the knowledge to better understand the mechanisms underlying the tissue decline, cancer development and other diseases associated with aging. We will discuss how stem cells including both tissue stem cells and cancer stem cells are generated and maintained in tissues and apply the knowledge to regenerative medicine and treatment of cancer and other diseases.

Available programs:

Lecture and Special Lecture　: To be announced by E-mail
Seminar　: To be announced by E-mail

Practice

Goals/Outline:
The purpose of our Journal Club is to introduce Stem Cell Biology and Cancer Biology to participants by providing an opportunity to read, present, and discuss some noteworthy papers of high impact and quality in the field. We will aim to distinguish what is known from what is not known, and determine what should be done next. Students will learn how to plan experiments, how to analyze and interpret the results.

Available programs:

Journal Club　10:00-11:00 AM on Monday
Progress Report　11:00-12:00 AM on Monday

Lab

Goals/Outline:
The purpose of our Lab is to provide an opportunity to learn in vivo and in vitro analysis of tissue stem cells from genetically modified mice. The techniques include immunohistochemical staining, histological analysis, FACS analysis and generation of transgenic mice.

Available programs:

Hands-on Lab: To be announced by E-mail

7. Grading System

Report (80%) and discussion (20%)

8. Prerequisite Reading

Read the sections about stem cells in "Molecular Biology of THE CELL", " the biology of Cancer" (by Robert A. Weinberg) and StemBook online.

9. Reference Materials

Molecular Biology of THE CELL, the biology of Cancer (by Robert A. Weinberg) etc.

10. Important Course Requirements

Please make contact with Prof. Emi Nishimura by e-mail first. Summarize common definitions and explanations of key concepts about stem cells, stem cell renwal, and propose the best way to identify somatic stem cells in tissues. Submit the repot (in 3 pages) by the end of December.

11. Availability in English

Available

12. Office Hour

9:30-16:30 TEL:03-5803-4651, E-mail:nishscm@tmd.ac.jp

13. Note(s) to students

NP

Respiratory Medicine

Lecture	(code:	７５８１	1st year	:6units)
Practice	(code:	７５８２	1st～2nd year	:4units)
Lab	(code:	７５８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Naohiko Inase
Contact person: Naohiko Inase　E-mail: ninapulm@tmd.ac.jp

2. Classroom/Lab

M&D tower, north1303

3. Course Purpose and Outline

Respiratory Medicine deals with a variety of pulmonary diseases including tumors, infectious diseases, allergic diseases, non-allergic inflammatory diseases, and genetic disorders.

4. Course Objective(s)

Main objective of integrated pulmonology in the graduate course is to provide students to study specific diagnostic modalities as well as basic scientific findings regarding the pathogenesis of pulmonary diseases.

5. Format

After reviewing a variety of pulmonary diseases and the latest topics, pathogenesis of each pulmonary disease will be discussed.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Integrated pulmonology deals with a variety of pulmonary diseases including tumors, infectious diseases, allergic diseases, non-allergic inflammatory diseases, and genetic disorders.　Main objective of integrated pulmonology in the graduate course is to provide students to study specific diagnostic modalities as well as basic scientific findings regarding the pathogenesis of pulmonary diseases.

Available programs:

Journal Club　Saturday, 8:00 am
Conference　Saturday, 9:00 am

Practice

Goals/Outline:
Respiratory Medicine clinic provides a full spectrum of diagnosis and treatment of a variety of pulmonary diseases.　Consultant system is open to all departments in this hospital and daily clinical conference regarding inpatients is organized by professors of the department.　In outpatient clinic, chemotherapy, home oxygen therapy, support for ceasing smoke, management of sleep apnea, and arrange of clinical studies are provided.

Available programs:

Conference of Pulmonary Medicine Every weekday, 8:30 am
Round for in-patients　Thursday, 9:00 am
Joint conference of Surgery &Pathology Wednesday. 5:00 pm

Lab

Goals/Outline:
1) Pathogenesis of hypersensitivity pneumonitis and detection of environmental causative antigen
2) Airway remodeling in bronchial asthma model
3) Acute exacerbation in pulmonary fibrosis
4) Proteomics of pulmonary fibrosis associated with collagen vascular disease
5) Pathogenesis of pulmonary fibrosis and emphysema

Available programs:

Lab meeting any time

7. Grading System

By participation to the conference, routine bench work, and results of each study

8. Prerequisite Reading

Alberts B, et al: Molecular biology of the cell. 6th edition, 2014.

9. Reference Materials

West JB: Respiratory physiology: The essential. Eight edition, 2008.

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

9:00 – 17:00

13. Note(s) to students

Students who have interest in pulmonary medicine are welcome to join us.

Gastroenterology and Hepatology

Lecture	(code:	７５９１	1st year	:6units)
Practice	(code:	７５９２	1st～2nd year	:4units)
Lab	(code:	７５９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Mamoru Watanabe
Contact person: Kiichiro Tsuchiya E-mail dept.gast@tmd.ac.jp

2. Classroom/Lab

Different with each course.

3. Course Purpose and Outline

The purpose of this course is the understanding the situation of inflammatory bowel disease (IBD) in Japan and the problems about the pathogenesis and intractable cause of IBD. In addition, the understanding the patogeneisis and problems about the liver diseases such as viral hepatitis, cirrhosis and hepatocelluar carcinoma is the purpose of this course.

4. Course Objective(s)

The objective of this course is to learn the basic sciense such as molecular biology, immunology, cancer biology and regenetive medicine for understanding the problems about G.I and liver disease. Moreover, it is to performe the examinaton for the elucidation of own study thema.

5. Format

Different with each course.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Research project is selected from the clinical problems in the Gastroenterology and Hepatology to understand the research policy, as clinical science that the results of research project finally should be restored to clinical medicine.

Available programs:

Research Conference	every Tuesday	18:00~19:30
Journal Club	every Tuesday	18:00~19:30

Practice

Goals/Outline:
To cultivate the awareness of the issues that the subject of basic research is awaken from medical practice through learning the fundamental knowledge such as endoscopic technique and clinical information of gastroenterology.

Available programs:

Clinical conference	every Tuesday 7:30~8:30
Endoscopic examination	every Tuesday, Thursday, Friday
X-ray examination	every Wednesday
Abdominal echo examination	every Monday, Friday

Lab

Goals/Outline:
To get novel knowledge by basic research raised from clinical practice.

Available programs:
Mucosal immunology
Digestive regeneration
Hepatitis
Liver regeneration

7. Grading System

Different with each course.

8. Prerequisite Reading

To learn the basic knowledge about gastroenterology. To read the previously published papers of this laboratory.

9. Reference Materials

not specified. Books for molecular biology, immunology, clinical medicine

10. Important Course Requirements

Nothing in particular

11. Availability in English

None

12. Office Hour

every wednesday 9:00-12:00 (reservation required) Contact person: Kiichiro Tsuchiya E-mail dept.gast@tmd.ac.jp

13. Note(s) to students

We prepare many opportunities for the study abroad.

Specialized Surgeries

Lecture	(code:	７６０１	1st year	:6units)
Practice	(code:	７６０２	1st～2nd year	:4units)
Lab	(code:	７６０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor, Hiroyuki Uetake ; Associate Professor, Hirotoshi Kobayashi, and Megumi Ishiguro
Contact person: Hiroyuki Uetake E-mail h-uetake.srg2@tmd.ac.jp

2. Classroom/Lab

Operative Conference, B-5 conference room; Clinical Conference, A-9 conference room

3. Course Purpose and Outline

Not decided (Department will change to ' Department of Surgical Specialties)

4. Course Objective(s)

Not decided (Department will change to ' Department of Surgical Specialties)

5. Format

Not decided (Department will change to ' Department of Surgical Specialties)

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/Outline:
Surgery for cancers of the stomach, the colon and rectum and the breast is the most important tool, but recently chemotherapy has achieved great advance. In order to establish the strategy how to eradicate cancers, it is important to elucidate the mechanism of development and progression of cancers. The latest findings on surgical oncology are reviewed. The most effective therapy for nonresectable cancers is reviewed in view of a multidisciplinary treatment approach. Surgical treatment for cancers often complicates physiological dysfunctions in digestion ,absorption, defecation, sexual intercourse and urination, resulting in impairing post-operative QOL. The students take the lectures about anatomy and physiology of the digestive organs and the breast to acquire the knowledge required to prevent a decline in QOL.

Available programs:

Lecture: As necessary
Special Lecture: As necessary
Seminar: As necessary
Journal Club: Every Thursday, 15:00 - 16:30
Research Conference: Every Thursday, 15:00 - 16:30

Practice

Goals/Outline:
  The goals of the practice in this course are as follows:
1) Understanding the procedures of diagnosis of cancers of the gastrointestinal tract and the breast.
2) Selecting the most appropriate treatment approach including surgical resection and chemotherapy based on the staging and patient survival.
3) Preventing the physiological and neurological dysfunction complicated tfter surgery.

Available programs:

Clinical Round: Every Monday and Thursday, 9:00 - 10:00. Tuesday, Wednesday and Friday, 8:00-9:00
Pre-operative Conference: Every Thursday, 7:30 - 9:00
Post-operative Conference: Every Monday, 7:30 - 9:00
Clinical Conference: Upper GI, every Monday, 17:30 - 20:00;
Clinical conference: the colon and rectum, every Wednesday, 17:30 - 20:00; Clinical conference: the breast, every Friday, 18:00 - 19:00

Lab

Goals/Outlines:
1) Development of novel therapeutics for gastrointestinal and breast cancers by elucidating invasion/metastasis mechanisms of cancer.
2) Identification of genes involved in gastrointestinal carcinogenesis by comprehensive analysis of mRNA and genomic DNA
3) Identification of predictive factors for response to chemotherapeutic agent and application of these findings to individualized medicine.
4) Development of the radical operation without dysfunction by clarifying the involvement of the automatic nerves in gastrointestinal motility, digestion and absorption, urination and ejaculation.
5) Development of less invasive operation for cancer of the stomach, the colon and rectum, and the breast.

Available programs:

Participation in a research group: As necessary

7. Grading System

1) Attendance to the lectures and the conferences
2) Contents of the research presentation
3) Contents of the article
The student is evaluated in consideration of the above three points.

8. Prerequisite Reading

Not decided (Department will change to ' Department of Surgical Specialties)

9. Reference Materials

Not decided (Department will change to ' Department of Surgical Specialties)

10. Important Course Requirements

Not decided (Department will change to ' Department of Surgical Specialties)

11. Availability in English

Available

12. Office Hour

9 am to 5 pm, Monday to Friday

13. Note(s) to students

Cardiovascular Medicine

Lecture	(code:	7611	1st year	:6units)
Practice	(code:	7612	1st～2nd year	:4units)
Lab	(code:	7613	2nd～3rd year	:8units)

1. Instructor(s)

Chairman, Mitsuaki Isobe Professor, Kenzo Hirao, Associate Professor, Takashi Ashikaga, Masahiko Goya
Contact person: Mitsuaki Isobe E-mail isobemi.cvm@tmd.ac.jp

2. Classroom/Lab

Appropriate location would be selected to study efficiently.

3. Course Purpose and Outline

The major purpose of our course is to educate state-of art as well as fundamental literacy of clinical and experimental cardiovascular medicine.

4. Course Objective(s)

The primary objective of our course is to enable our students to learn the latest knowledge and clinical skills of cardiovascular medicine.

5. Format

Senior doctor coaches student individually as the best way in any case. We offer the student both clinical research and basic investigation.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The rising epidemic of cardiovascular disease is fuelled by obesity, hypertension, diabetes and aging. Extensive research identified immunoinflammatory mechanisms as key drivers in the initiation and progression of the disease, from early asymptomatic stages of vascular and myocardial injury leading to the clinically manifest dysfunction and remodeling in advanced stages. Heart failure is the end stage of all cardiovascular diseases including arrhythmia, hypertension, myocarditis and others. We investigate the mechanisms of vascular and myocardial inflammation in cardiovascular disease. Besides, many clinical technique are required to treat both in-hospital and out-hospital patients, i.e PCI and ablation and implantation of ICD and CRT. Cardiac imaging (ultrasound, MRI, CT, PET, intracoronary imaging and others) is one of the most exciting and fast-developing area. Our aim of the lecture is to understand broad knowledge on the cardiovascular diseases from bench to bedside.

Available programs:

Lecture Periodically
Special Lecture Periodically
Seminar Thursday morning every two weeks
Journal Club Tuesday evening every two weeks
Conference Tuesday evening every two weeks

Practice

Goals/Outline:
We can offer all techniques to treat patients from fundamental skills to new and challenging tecniques. For example, we are doing PCI, Ablation on many origins of arrhythmia, implantation of pacemaker/ ICD/ CRT. We also conduct non-invasive imaging and medical treatment of patients with cardiovascular diseases.

Available programs:

Morning conference : every day
Professor's round : every Friday
Electrophysiology meeting : every Tuesday evening
Coronary angiography meeting : every Friday

Lab

Goals/Outline:
We identify the mechanisms of cardiovascular diseases especially focusing on the inflammation with cardiac transplantation and myocarditis. Our investigation is based on deep interest and passion to contribute findings new treatments of heart disease. The targets of our investigation cover myocardial ischemia, cardiac rejection of the transplantation, myocarditis, heart failure, atherosclerosis, periodontal disease, pulmonary hypertension, atrial fibrillation, and so on.

Available programs:

Molecular biology, Animal experiments, Electrophysiological study, Pathohistological analyses, Gene analyses are available.

7. Grading System

You will be graded as multi-dimensional and appropriate way.

8. Prerequisite Reading

It is necesarry for our sudents to have essential knowledge regarding biology and medicine.

9. Reference Materials

Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. Douglas L. Mann, Douglas P. Zipes, Peter Libby, and Robert O. Bonow, eds. Elsevier, 2015 [ISBN: 978-1-4557-5134-1]

10. Important Course Requirements

None.

11. Availability in English

Available.

12. Office Hour

9:00 - 17:00 on weekdays.

13. Note(s) to students

We will provide whatever you need to study cardiovascular disease in clinical and basic ways.

Anesthesiology

Lecture	(code:	７６２１	1st year	:6units)
Practice	(code:	７６２２	1st～2nd year	:4units)
Lab	(code:	７６２３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Prof. Koshi Makita　　E-mail　makita.mane@tmd.ac.jp
Associate Prof: Tokujiro Uchida , Junior Associate Prof: Seiji Ishikawa, Jiro Kurata, Satoshi Toyama

2. Classroom/Lab

Depends on the program. Contacts the tutor before the course.

3. Course Purpose and Outline

A comprehensive understanding of research trends, research methods, and analysis of results by introducing the latest papers published in prestigious journals related to anesthesiology.

4. Course Objective(s)

Understanding research background, basic knowledge and skills necessary for the research.

5. Format

Laboratory programs are conducted by the tutor.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Fostering the academic specialists with particular knowledge and skills in the areas related to our professional. In particular, aiming ①to acquire the knowledge and technology throughout the perioperative management patients with severe systemic impaired organ function, ②to clarify the mechanisms of general anesthetic action and pain chronification in the human central nervous system that will help to develop methods to monitor intraoperative awareness and to diagnose chronic pain, ③to invent new modality of artificial ventilation, pain management, and fluid management in patients undergoing thoracic surgery aiming to improve their outcome, ④to identify mechanisms behind postoperative acute kidney injury and invent new measures for prevention, diagnosis, and treatment.

Available programs:

Lectures & Special Lectures: Will be held according to an agenda
Seminar: Will be held according to an agenda
Journal Club & Conference : Every morning 8:00-8:30

Practice

Goals/Outline:
Acquiring various anesthetic methods for clinical use as well as the basic knowledge and skills for research. In addition, future educators in the field experience teaching practice for trainee doctors.

Available programs:

Initial training program of clinical anesthesia for necessary persons.

Lab

Goals/Outline:
1)Discovering most effective ventilation methods for injury lungs.
2) Therapeutic mechanism of mesenchymal stem cell for lung injury (rat and mouse model)
3) Studies on the central nervous system effects of general anesthetics by human electrocorticogram and functional neuroimaging.
4) Studies on the mechanisms of cerebral pain processing and pain chronification by human functional magnetic resonance imaging and positron emission tomography.
5) Studies on the effects of protective one-lung ventilation on ventilatory mechanics.
6) Epidemiologic studies to identify incidence of, and risk factors for postoperative acute kidney injury in patients undergoing liver resection.
7) Studies on the effect of anesthetics on the developing brain.

Available programs:

Participation in research groups such as 1) best mechanical ventilation for injured lungs in animal models, 2) mesenchymal stem cell for lung injury 3) etc

7. Grading System

A comprehensive evaluation by participation to lectures, experimental researches and presentation of the research results.

8. Prerequisite Reading

Articlses related to the research projects

9. Reference Materials

Journals such as "Anesthesiology", "Anesthesia and Analgesia", "British Jouranal of Anaesthesia "

10. Important Course Requirements

11. Availability in English

Available

12. Office Hour

Anytime except vacances period by email. mail address : makita.mane@tmd.ac.jp

13. Note(s) to students

Cardiovascular Surgery

Lecture	(code:	7 6 3 1	1st year	:6units)
Practice	(code:	7 6 3 2	1st～2nd year	:4units)
Lab	(code:	7 6 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Hirokuni Arai
Associate Professor: Tomohiro Mizuno
Contact person: Hirokuni Arai　E-mail: hiro.cvsg@tmd.ac.jp

2. Classroom/Lab

Different venue depending on the specific program

3. Course Purpose and Outline

To analize the unsolved phenomena and etiologies of Cardiovascular diseases, and to acquire the ability and the skill to solve those mechanisms.

4. Course Objective(s)

To be able to point out the unsolved phenomena and the etiologies of Cardiovascular diseases, and to acquire the skills of analyzing and solving those problems.

5. Format

Small-group guidance

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Cardiovascular Surgery is a discipline of medical science which deals the surgical treatment of the disease of heart and aorta. Main objective of Cardiovascular Surgery in the graduate course is to provide students opportunity to study surgical anatomy, pathophysiology, pharmacology, and advanced treatment. Students are also taught basic research for the surgical treatment.

Available programs:

Journal Club: Tuesday 9:00-9:30
Cardiovascular Surgery Seminar: once in a year (4hrs)

Practice

Goals/Outline:
Practices on the methods and points of case history, physical examination, imaging diagnosis, and laboratory tests. The treatments and cares of patients are learned in accordance with the disease, as well as the perioperative cares and surgical techniques of cardiovascular surgery.

Available programs:

Professor rounds: Monday, Wednesday, Thursday and Friday 8:30-9:30am
Preoperative Conference: Thursday 8:00-9:30am　Surgical
Operation: Monday, Wednesday, Thursday and Friday
Research Conference: Tuesday 7:30-9:00am
Wet Labo: Tuesday 2:00-5:00pm(once in a month)

Lab

Goals/Outline:
To elucidate the mechanism of ischemic heart diseases, such as left ventricle dilatation and subsequent heart failure, mitral valve regurgitation (MR) and left ventricle aneurysm.
1) Developing technique of beating mitral valve surgery
2) Developing new technique/surgery for ischemic heart disease
3) Research for prognosis of postoperative patients with long term follow up

Available programs:

Laboratory: everyday
Research Conference: Tuesday 7:30-9:00

7. Grading System

Comprehensive evaluation system

8. Prerequisite Reading

You have to learn about basic knowledge about the etiologies, pathophysiologies, diagnosis, indications and surgical procedures of Caridovascular diseases in advance.

9. Reference Materials

Nicholas Kouchoukos, Eugene Blackstone, Frank Hanley, James Kirklin, *Kirklin/Barratt-Boyes CARDIAC SURGERY 4th*
Siavosh Khonsari, *CARDIAC SURGERY: Safegards and Pitfalls in Operative Technique*
Laurence Cohn, *CARDIAC SURGERY IN THE ADULT*

10. Important Course Requirements

N/A

11. Availability in English

Available in a partial program

12. Office Hour

Enquiry: Hirokuni Arai Cardiovascular Surgery Phone:＋81-3-5803-5267 Email:hiro.cvsg@tmd.ac.jp

13. Note(s) to students

N/A

Nephrology

Lecture	(code:	７６４１	1st year	:6units)
Practice	(code:	７６４２	1st～2nd year	:4units)
Lab	(code:	７６４３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Shinichi Uchida
Contact person: Shinichi Uchida E-mail suchida.kid@tmd.ac.jp

2. Classroom/Lab

MD Tower 13th floor Department of Nephrology

3. Course Purpose and Outline

We try to clarify the homeostatic actions in kidney and to understand the molecular pathogenesis of diseases caused by the dysregulations of kidney. Based on the pathogenesis, we try to develop novel therapeutic strategies.

4. Course Objective(s)

To understand the homeostatic actions in kidney and its dysregulations in disease states.

5. Format

Please refer to the teacher in charge of each program.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
We lecture molecular mechanism of homeostatic actions in kidney, and mechanisms of diseases when the homeostatic actions are dysregulated. In addition, we mention future prospective for advanced treatments for these diseases.

Available programs:

Lecture as needed
Special Lecture as needed
Journal Club Thursdays 17:00 - 18:00
Research Conference Every Monday 14:00 - 17:00

Practice

Goals/Outline:
In hospitalized patients, we try to understand pathogenesis of their diseases caused by dysregulation of homeostatic actions in the kidney, and to discuss therapeutic approaches based on the pathogenesis.

Available programs:

Ward round Thursdays 14:00 - 15:00
Case Conference Thursdays 15:00 - 17:00
Pathology Conference Tuesdays (twice a month) 17:00 - 18:30
Blood Purification Conference Thursdays 11:00 - 13:00

Lab

Goals/Outline:
We are extensively studying channels and transporters and their upstream regulators. Especially, we are focusing on the molecular pathogenesis of salt-sensitive hypertension and its consequence in various organs in the body. Generation and analysis of genetically engineered mice is one of the major strategies for this research. We are considering the use of next generation sequencing to identify responsible genes for kidney disease of unknown etiology.

Available programs:

We can accept as needed.
We can provide opportunity for studying abroad.

7. Grading System

We give a grade from comprehensive standpoint based on attendance and research results.

8. Prerequisite Reading

You should know the basic kidney structures and functions.

9. Reference Materials

Renal Pathophysiology The essenrial. Lippincott Williams & Wilkins
Brenner & Recor's The Kidney. Elsevier.

10. Important Course Requirements

nothing special

11. Availability in English

Available

12. Office Hour

9:00-17:00 Mon-Fri

13. Note(s) to students

Comprehensive Reproductive Medicine

Lecture	(code:	7651	1st year	:6units)
Practice	(code:	7652	1st～2nd year	:4units)
Lab	(code:	7653	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Toshiro Kubota
Associate professor: Satoshi Obayashi
Junior associate professor: Naoyuki Yoshiki
Contact person: Toshiro Kubota E-mail t.kubota.gyne@tmd.ac.jp

2. Classroom/Lab

OB/GYN conference room on the 8th floor in the medical hospital building B (B-8)

3. Course Purpose and Outline

CRM (OB/GY) department has an obligation to offer medical services, education, research as one of the clinical departments in national graduate school, and has duty on making a mutual cooperation with local gynecological institutions.

Educational intention in medical doctor course and nursing course includes systemic lectures, clinical conferences and special lecture by many extramural speakers. During clinical clerkship learning period, students should be treated as one of medical stuffs, attend all of deliveries and be present at gynecological procedure. Several OB/GY institutions will be provided as an extramural drills.

4. Course Objective(s)

Our main objectives are
1, Investigation for a new progress in treatment technique
2, Acquisition of medical knowledge and procedure
3, Providing systemic lecture about women's physiological and pathological change during adolescence through senescence.

Aims of research works are focusing on reproductive medicine, perinatal medicine and oncology.

5. Format

A lot of lectures by active leaders in the front line of various fields are held during the doctor course, which is free to join. But this practice is essential to be inspired to get the knack. Every stuff and mentor in the department can lead to get the technique of the experiments and the research presentation and to complete thesis.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:

Our goal is to understand systemically from the physiological to the pathological condition through clarifying characteristics of the reproductive cells and organs, and to foster the universal education of reproductive endocrinology, perinatal medicine, gynecological oncology, climacteric/menopausal medicine and gynecological infection disease. These 5 fields are the main targets of this department.

Available programs:

Lecture As needed
Special Lecture As needed
Seminar As needed
Journal Club Monday 8:00- 8:30
Operation Conference Monday 16:00 - 18:00
Research Conference Friday 17:00 - 19:00

Practice

Goals/outline:
To acquire the clinical skill of medical diagnosis and therapeutic maneuver based on understanding the lecture.

I Reproductive endocrinology: Mastering of the ovulation induction, oocyte pick-up and ICSI by attending IVF program
II Perinatal medicine: Acquisition of assessment technique on maternal and fetal condition by joining obstetrical team
III Gynecological oncology: Mastering medical diagnosis and therapeutic maneuver through bed-side learning
IV Climacteric/menopausal medicine: Mastering therapeutic maneuver to improve female QOL by attending menopausal clinic
V Gynecological infection disease: Attending the clinic and acquirement of therapeutic maneuver

Available programs:

Gynecological pathology conference 3rd Monday 18:00- 20:00
IVF conference As needed
Professor's round & pre-operation conference Every Monday 14:00- 17:00
Post-operation conference Everyday (except Monday) 16:00- 17:00

Lab

Goals/Outline:
As a clinical department, laboratory experiments need to restore the results to practical medicine like diagnostic methods, therapeutic maneuver and preventive medicine.

I Reproductive endocrinology:
1 Development of the method to increase intracellular Ca2+ influx to obtain restored fertility
2 Improvement of implantation by clarifying physiology of granulosa cell, germ cell, villi, endometrium.
II Perinatal medicine:
1 Elucidation of the CP mechanism by MRI and pathology with using the animal model of cerebral blood flow occlusion.
2 Clarifying the mechanism of the uterine contraction through nitric oxide – arginine pathway
III Gynecological oncology:
1 Investigation of the effect of the growth factors on cultured carcinoma cells
2 Constructive mechanism of blood vessel with using

IV Climacteric/menopausal medicine:
1 Revelation of osteoporosis with cultured osteoblast and osteoclast
2 Clarification of female hormone on the endothelial function and the formation of atherosclerosis
3 Explanation of aging on central nervous system
V Gynecological infection disease: Attending the clinic and acquirement of therapeutic maneuver
1 To reveal the infection mechanism of herpes and adenovirus

Research divisions :
1) Research in physiology, endocrinology and metabolism in the reproductive medicine
2) Research of female physical and mental changes with aging
3) Pathophysiological examination of gynecological oncology
4) Clinical research and basic research in perinatal medicine

Available programs:

1, Cell culture technique of ovarian granulosa cells, endometrial cells, malignant cells, osteoblast and so on.
2, Determination of intracellular calcium (by Fura 2 method)
3, Measurement of intra-cellular IP3
4, Hormonal assay in plasma, urine, follicular fluid (RIA & EIA)
5, Immunohistochemistry with ABC method
6, Analysis of micro-structure with electrical microscopy
7, Determination with molecular biological technique.
8, Physiological determination of endothelial function
9, Determination of cerebral blood flow with MRI in cerebral infarction
10, Analysis of protein expression with flow-cytometry

7. Grading System

Grading will be done by these factors;
Lecture: attendance and discussion
Practice: clinical service at out and admitted patients
Lab: individual discussion with mentor and monthly progress report at research meeting

8. Prerequisite Reading

Students can get the reference materials from the lecturer and discuss with them.

9. Reference Materials

Lecturer will inform the materials later.

10. Important Course Requirements

nothing

11. Availability in English

available

12. Office Hour

contact person: Prof. Toshiro Kubota E-mail t.kubota.gyne@tmd.ac.jp

13. Note(s) to students

We will strongly recommend to joining the OB/GYN related medical society. A part of necessary expense should be supported by the department.

Urology

Lecture	(code:	７６６１	1st year	:6units)
Practice	(code:	７６６２	1st～2nd year	:4units)
Lab	(code:	７６６３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kazunori KIHARA, Associate Professor: Yasuhisa FUJII
Contact person: Yasuhisa FUJII E-mail y-fujii.uro@tmd.ac.jp

2. Classroom/Lab

Venues are different according to the program.

3. Course Purpose and Outline

Urology is the surgical specialty that focuses on the urinary tracts, and on the male reproductive system. The organs covered by urology include the kidneys, adrenal glands, ureters, urinary bladder, urethra, and the male reproductive organs (testes, epididymis, vas deferens, seminal vesicles, prostate and penis). Urology is closely related to, and in some cases overlaps with, diverse medical fields including oncology, nephrology, gynecology, andrology, neurology, pediatric surgery, gastroenterology, and endocrinology. Minimally-invasive surgery for urological disorders has been one of the most important topics in this field.

4. Course Objective(s)

Our course objectives include;
1) to understand the pathophysioogy and means of diagnosis and treatment of various urological disorders and to appropliately diagnose, treat, and manage patients with these diseases.
2) to learn RoboSurgeon gasless single-port surgery, which is one of the minimally-invasive surgeries and has been developed in our department.
3) through basic research, to gain new findings which will lead to the improvement of oncological and functional outcomes of patients with urological diseases.

5. Format

A small class in which the students will be trained though mutual discussion.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline
The urinary tracts and the male reproductive system are well controlled by automatic and somatic nervous systems and endocrine systems. The students will learn these modulating systems, destruction of which will lead to various urologic symptoms and diseases. And the students will also learn the etiology, diagnosis and treatment of urologic malignant diseases. Minimally-invasive surgery for urological disorders has been one of the most important topics in this field.

Available programs:

Lecture : Every Monday 7:00-8:00
Special Lecture: As needed (Usually 3 times a year)
Seminar: Every Saturday 7:00-10:30
Clinical Conference: Every Thursday 17:00-18:00
Case Conference: Every Thursday 7:00-9:00

Practice

Goals/Outline:
Medical professionals specializing in the field of urology are called urologists and are trained to diagnose, treat, and manage patients with urological disorders. Particularly, our graduate students will learn RoboSurgeon gasless single-port surgery, which is one of the minimally-invasive surgeries and has been developed in our department. The students will also learn urologic radiology, be promoted the ability of logical thinking, and will also have a lot of chances to improve their English presentation skills by preparing papers for international journals and meetings. Case conference is held in English.

Available programs:

Urologic Radiology Conference: Third Thursday 18:00-19:00
Study Presentation: As needed (in the international and domestic meetings, usually 4 times a year)
Ward round: Every Thursday 17:00-18:00
Attendance of Surgery: As needed
Preoperative Case Conference: Every Thursday 7:00-9:00

Lab

Goals/Outline:
Following studies have been extensively carried out in our laboratory with various biological and molecular biological techniques:
1) Overcoming therapeutic resistance to chemo- and/or radiotherapy against urological malignancies using novel molecular targeted agents
2) Investigation on functional roles of mitochondrial molecular chaperone TRAP1 in malignant cancer cells
3) Development of radiation-sensitizing strategy to bone metastasis by modulating STAT1 expression
4) Investigation on the underlying mechanisms of diffusion-weighted MRI signals of urological malignancies

Available programs:

Participation in a research group, cell and animal researchs: As needed

7. Grading System

Grading are performed in a comprehensive way based on the lecture, practice, and laboratory participation situation, reports about research, the number of presentation in the international meetings and publication in the journals, conference presentations, and surgery paticipation .

8. Prerequisite Reading

It is preferred to acquire the basic knowledge of urologic diseases and basic skills of basic research before admission.

9. Reference Materials

Kazunori Kihara edited, Illustrated minimum incision urologic surgery, Igakushoin (in Japanese)
CAMPBELL-WALSH UROLOGY, 10th EDITION, ELSEVIER
European Association of Urology Guidelines, http://www.uroweb.org/guidelines/online-guidelines/

10. Important Course Requirements

Nothing in particular

11. Availability in English

Available

12. Office Hour

9:00-17:00, Phone: 03-5803-5295
Yasuhisa Fujii, E-mail: y-fujii.uro@tmd.ac.jp

13. Note(s) to students

Nothing in particular

Gastrointestinal Surgery

Lecture	(code:	7671	1st year	:6units)
Practice	(code:	7672	1st～2nd year	:4units)
Lab	(code:	7673	2nd～3rd year	:8units)

1. Instructor(s)

Professor Tatsuyuki KAWANO
Associate Professor Yasuaki NAKAJIMA
Contact person: Tatsuyuki KAWANO TEL 5803-5252 E-mail kawano.srg1@tmd.ac.jp

2. Classroom/Lab

Different venue depending on the specific program, mainly at our medical office

3. Course Purpose and Outline

The graduates will understand various gastrointestina. diseases and attain the ability to manage these diseasaes and the problems of patients, through clinical experiences and basic researches.

4. Course Objective(s)

1.Understanding of surgical health care system delivery to both inpatients and outpatients. 2.Learning surgical technique of gastrointestinal surgery as an operator or assistants. 3.How to conduct clinical and/or basic research on gastointestinal disease in collaboration with the other fields of specialists. 4.To promote skills in presentation at scientific meetings. 5.Acquisition of educational methods for junior surgeons. 6.Function as a member of the surgical team.

5. Format

With the instructors, clinical questions are discussed, presented, and finally contributed as the original paper.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Our goals are to develop the new methods of diagnosis and treatment of the disease of digest tract to contribute to the medical progression. Also, we aim to bring up young doctors of gastrointestinal and general surgery.

Available programs:

Lecture	as needed (A/N)
Special Lecture	A/N
Seminar	A/N
Conference	on every Monday and Thursday, at 7:30 am.

Practice

Goals/Outline:
Our goals are to learn and study the methodology of the diagnosis and treatment of the esophageal and general surgery clinically.

Available programs:

Professor's round every Thursday
Preoperative Conference: Every Thursday AM7:30-9:00
Postoperative Conference: Every Monday AM7:30-9:00
Surgical Operation: Every Monday, Tuesday, Wednesday and Thursday
Ward Round: Every Day AM7:30-9:00
GI Conference: Every Thursday PM16:30-18:00
Joint Conference with Pathological Department: Every Thursday PM18:00-19:00

Lab

Goals/Outline:
Our goals are to analyze the disease of digestive tract physiologically, molecular biologically, and pathologically, and to examine the general surgical technique, post-operative management, preventive medicine, and epidemiology.

Available programs:

Participation in research groups: A/N

7. Grading System

Grading is performed according to the attending to our lecture, conference and clinical practice. The contents of the research are also graded.

8. Prerequisite Reading

Besides knowledge of surgery and digestive surgery, comprehension of basic anatomy and physiology is required.

9. Reference Materials

Nothing in particular.

10. Important Course Requirements

Nothing in particular.

11. Availability in English

None

12. Office Hour

Contact person: Tatsuyuki Kawano, M.D., Ph.D. Professor of the Departmenent of Gastrointestinal Surgery, E-mail: kawano.srg1@tmd.ac.jp Ms. Takizawa, Secretary of Gastrointestinal Surgery, E-mail: secr.srg1@tmd.ac.jp

13. Note(s) to students

No limitation for participants

Thoracic Surgery

Lecture	(code:	７６８１	1st year	:6units)
Practice	(code:	７６８２	1st～2nd year	:4units)
Lab	(code:	７６８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kenichi Okubo
Contact person: Kenichi Okubo E-mail: okubo.thsr@tmd.ac.jp

2. Classroom/Lab

M&D tower, South S2060-2061

3. Course Purpose and Outline

Thoracic Surgery is a discipline of medical science which deals the surgical treatment for the disease of lung, mediastinum and diaphragm. The goal of the course is to educate next-age thoracic surgeon with surgical mind and well-trained surgical skills.

4. Course Objective(s)

Main objective of Thoracic Surgery in the graduate course is to provide students opportunity to study surgical anatomy, pathophysiology, pharmacology, and advanced treatment. Students are taught basic scientific research regarding the pathogenesis of respiratory diseases.

5. Format

Small-group guidance

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Thoracic Surgery deal with surgical diagnosis and treatment for respiratory diseases, such as lung cancer, metastatic pulmonary tumors, infectious diseases, and pleural malignancy. Students are taught the latest basic and/or clinical research for the surgical treatment.

Available programs:

Lab Meeting: Tuesday
Special Lecture: As Necessary
Seminar: As Necessary
Journal Club: Tuesday

Practice

Goals/Outline:
Practices on the methods and points of case history, physical examination, imaging diagnosis, and laboratory tests. The treatments and cares of patients are learned in accordance with the disease and cancer stage, as well as the perioperative cares and surgical techniques of thoracic surgery.

Available programs:

Preoperative Conference: Monday 18:00 - 20:00
Postoperative Conference: Monday 17:30-18:00
Clinical Round: Tuesday 8:00-9:00
Clinic-Pathological Conference: Wednesday 17:00-19:00
Operative Days: Monday, Wednesday, Thursday, Friday

Lab

Goals/Outline:
1) Developing of novel therapeutics for lung cancer by elucidating invasion/metastasis mechanism of cancers
2) Identification of genes as predicting factors in surgically resected specimens
3) Development of multimodality treatment for locally advanced lung cancer

Available programs:

Participation in research groups: As necessary

7. Grading System

By participation to the conference, routine bench work, and results of each study

8. Prerequisite Reading

Needs for basic surgical approach in thoracic surgery

9. Reference Materials

Not specifically indicated

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

9:00 – 17:00

13. Note(s) to students

Students who have interest in pulmonary medicine are welcome to join us.

Igakuken Disease-oriented Molecular Biology

Lecture	(code:	９０２１	1st year	:6units)
Practice	(code:	９０２２	1st～2nd year	:4units)
Lab	(code:	９０２３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Afilliated Professor Takahiko Hara (E-mail: hara-tk@igakuken.or.jp)
Afilliated Professor Masanari Itokawa (E-mail: itokawa-ms@igakuken.or.jp)
Afilliated Professor Masato Hasegawa (E-mail: hasegawa-ms@igakuken.or.jp)
Afilliated Professor Haruo Okado (E-mail: okado-hr@igakuken.or.jp)

2. Classroom/Lab

Please make a contact with the corresponding professor before starting each class.

3. Course Purpose and Outline

For the healthy aging, we must reduce the risk rate of cancer and diabetes. We also need to develop novel therapeutic approaches against incurable mental and neurodegenerative diseases. Recently, the iPS technology has been proven to be useful not only for generating functional cells for transplantation but also for establishing patient-based disease models. We will educate graduate students who have sufficient knowledge and experimental techniques in the above described biomedical fields.

4. Course Objective(s)

Reading capacity of latest articles in the biomedical fields. Writing and presentation capacity of each participant's own research data obtained by ethically correct procedures.

5. Format

All the classes will be interactive with small numbers of participants.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline: By listening to professional lectures, participants are able to understand molecular mechanisms of life-threatening diseases such as cancer, diabetes, schizophrenia, amyotrophic lateral sclerosis, and brain malformations. Such knowledge will eventually lead us to develop novel therapeutic strategies against them. In addition, it is important to establish good animal models (including genetically engineered mouse strains), which faithfully reproduce symptom and progression of the diseases.

Available programs:

Lecture: Igakuken lancheon seminar (1 per month)
Special Lecture: Igakuken symposium (1 per year), Igakuken lecture series (8 per year)
Seminar: Igakuken international symposia (2 per year), Igakuken seminars (2-3 per month)
Journal club: [Takahiko Hara] Tuessday 16:00—18:00, [Masanari Itokawa] Wednesday 10:00—12:00,
[Masato Hasegawa] Friday 14:00—16:00, [Haruo Okado] Tuesday 12:00—14:00

Practice

Goals/Outline: Participant summarizes the results of research activity as a progress report. Through mutual discussion with professors and other lab members, he/she would know a better future direction. Once obtaining sufficient experimental data to draw a definitive conclusion, participant can present his/her paper in a public or closed conference. We will instruct how to make a good poster and understandable presentation files. Meanwhile, participants can learn the newest knowledge and trend in a particular medical research field of their interest by reporting highlights of the conference/symposium to professors and lab members.

Available programs:

Research progress report: [Takahiko Hara] Thursday 16:00—18:00, [Masanari Itokawa] Monday 10:00—12:00,
[Masato Hasegawa] Monday 16:00—18:00, [Haruo Okado] Thursday 12:00—14:00
Rehearsals and reports for conferences (1-2 per year)
Igakuken internal conference for young investigators (1 per year)

Lab

Goals/Outline:
[Takahiko Hara] We attempt to elucidate how hematopoietic stem cells are developed, self-renewed, and differentiated into mature blood cells by utilizing in vitro differentiation systems of ES/iPS cells and conditional KO mouse strains. Such a knowlege will be used for the regenerative medicine of blood cells. In addition, we advance the molecular biology of CXCL14, which is involved in obesity-induced diabetes, carcinogenesis, feeding behavior, etc.

[Masanari Itokawa] Our research focuses on unraveling the pathophysiology of mental illnesses using molecular biology tools. Our ultimate goal is to identify new disease mechanisms, leading to the development of novel and more efficacious therapies. We perform genetic association studies, as well as metabolomics studies using blood and iPS cells from patients with mental disorders. Any abnormalities identified from patient samples are investigated further, using in vitro and in vivo systems, such as, cell culture assays to highlight functional alterations and behavioral studies in gene knock-out mouse models.

[Masato Hasegawa] We investigate the molecular pathogenesis and progression of neurodegenerative diseases including Alzheimer's disease, Parkinson's disease and amyotrophic lateral sclerosis. We use biochemistry, immunohistochemistry and molecular biology in all our work of in vitro, cellular and animal models to find effective ways for clinical therapy.

[Haruo Okado] To discover the fundamental cause of various nervous diseases, e.g., brain tumors, brain malformations, and neurodevelopmental disorders, we will study the molecular mechanisms for the regulation of neural development in the cerebral cortex using gene-targeted mice, primary cultures, viral vectors, in-utero electroporation, real-time imaging of slice culture, immunohistochemistry, and transcription analysis.

Available programs:
The corresponding will individually show appropriate programs to participants.

7. Grading System

Participants will be evaluated based on their overall attendance rate to lecture classes and courses (80%), and their research performance in terms of presentation at scientific conferences and submitting papers (20%).

8. Prerequisite Reading

The corresponding professor will individually advise participants according to their research plan and capacity.

9. Reference Materials

The corresponding will individually show appropriate references to participants.

10. Important Course Requirements

None.

11. Availability in English

Available

12. Office Hour

Professor Takahiko Hara: Upon request.
Professor Masanari Itokawa: Upon request.
Professor Masato Hasegawa: Upon request.
Professor Haruo Okado: Upon request.

13. Note(s) to students

None.

Clinical Anatomy

Lecture	(code:	７６９１	1st year	:6units)
Practice	(code:	７６９２	1st～2nd year	:4units)
Lab	(code:	７６９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Keiichi Akita,　Junior Associate Professor: Akimoto Nimura,　Assistant Professor: Masayo Harada

2. Classroom/Lab

Various rooms will be used depending on the program. Please check by yourself or ask instructors before attending the course.

3. Course Purpose and Outline

Clinical Anatomy is a field of study to solve the problems from clinical medicine through formulations of human anatomical and developmental biological bases of diagnoses and surgical procedures. The course is aimed to understand the structure of the human body based on the human anatomy and acquire an ability to describe the human body structures clearly from the findings of observations.

4. Course Objective(s)

The course is aimed to understand the spatial arrangements of human body structures from various angles and acquire the observing ability as a medical worker and a researcher.

5. Format

Small group instruction will be mainly performed to facilitate free discussion between participants and instructors.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Lectures are aimed to understand clinical anatomy for proper diagnosis and treatment. Comparative anatomy and developmental biology are also applied for better understanding about the spatial arrangement of the organs or vessels.

Available programs:

Lecture　The second Monday of each month 18:00 to 20:00
Seminar　The thrid Monday of each month 18:00 to 20:00

Practice

Goals/Outline:
Practice is aimed to find out the way to understand the facts. This process is designed through the dissected cadavers, or reading papers. Staining or special dissection technique is available depends on the research purpose.

Available programs:

Seminar　The third Monday of each month 18:00 to 20:00

Lab

Goals/Outline:
Lab is aimed to find out the way to reveal the facts. Histological analysis or embryological research is helpful for understanding of the clinical anatomy. These techniques are applied for special part of the body with student's special interest. Especially we are active in the research fields of cloacal development and synovial joint development using genetically modified mouse embryos.

Available programs:

Participation in a research group A/N

7. Grading System

Performance will be generally evaluated considering the content of research reports, presentation status at the meeting or seminar, publication and so on.

8. Prerequisite Reading

Trying to understand the basic anatomical structures and the developmental processes of the parts of the body which each student is interested in. Trying to pick up unclarified and controversial issues on diagnoses and surgical procedures.

9. Reference Materials

Gray's Anatomy for Students, Second Edition, 2010, Elsevier, Langman's Medical Embryology, Eleventh Edition, 2010, Wolters Kluwer Lippincott Williams & Wilkins, Principles of Development, Tourth Edition, 2011, Oxford University Press

10. Important Course Requirements

none

11. Availability in English

none

12. Office Hour

Contact person: Keiichi Akita. e-mail; akita.fana@tmd.ac.jp

13. Note(s) to students

The number of students is not limited.

Systems BioMedicine

Lecture	(code:	７７０１	1st year	:6units)
Practice	(code:	７７０２	1st～2nd year	:4units)
Lab	(code:	７７０３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor Hiroshi Asahara E-mail asahara.syst@tmd.ac.jp

2. Classroom/Lab

Not determined yet.

3. Course Purpose and Outline

This course covers systems biology, non-coding RNA and epigenetics in medical fields. Our recent accomplishment of a whole-mount in situ hybridization (WISH) database, termed EMBRYS, containing expression data of 1520 transcription factors and cofactors expressed in E9.5, E10.5, and E11.5 mouse embryos led us to identify critical cascade for myogenesis (Rp58; Dev Cell, 2009) and tendon development (Mkx, PNAS 2011). Also, our current study on non-coding RNA provides evidence that microRNA can act not only for cartilage development but also for its homeostasis against arthritis (Genes Dev, 2011). These findings and strategies will be shared in this course.

4. Course Objective(s)

Subject1: The function of non-coding RNA in development and diseases will be examined.
Subject2: Genome dynamics during embryogenesis will be monitored by new technique.
Subject3: Novel systems approaches will be established and applied for developmental biology and medicine.

5. Format

Concept and techniques of systems biomedicine will be introduced in the seminar series.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Analyze genome network for tissue development and pathogenesis of inflammation by combining multiple systems approaches.

Available programs:

Lecture	irregular
Special Lecture	irregular
Seminar	irregular
Journal Club	irregular
Conference	irregular

Practice

Goals/Outline:
Mircoarray, Cell-based high throughput screening, etc, will be utilized as critical method for systems biomedicine.

Available programs:

Mircoarray, Cell-based high throughput screening, mice gene targeting experiments irregular

Lab

Goals/Outline:
Using our techniques, core molecular network for tissue development and inflammatory diseases will be examined.

Available programs:

The function of on-coding RNA in development and diseases will be examined.
Development and regeneration using ES and iPS will be analyzed.
Genome dynamics during embryogenesis will be monitored by new technique.
Novel systems approaches will be established and applied for developmental biology and medicine.

7. Grading System

Individual's acquisition will be carefully evaluated by presentation, report and publication.

8. Prerequisite Reading

None

9. Reference Materials

None

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

9:00 a.m. - 5:00 p.m.

13. Note(s) to students

The attendee may have to utilize adenovirus and mice samples.

Comprehensive Pathology

Lecture	(code: 7711	1st year	:6units)
Practice	(code: 7712	1st～2nd year	:4units)
Lab	(code: 7713	2nd～3rd year	:8units)

1. Instructor(s)

Professor Masanobu Kitagawa
Contact person Masanobu Kitagawa E-mail: masa.pth2@tmd.ac.jp

2. Classroom/Lab

Various rooms will be used depending on the program. Please check by yourself or ask instructors before attending the course.

3. Course Purpose and Outline

To understand the patho-biological characters of various diseases, comprehensive methods to analyze various morphological/functional disturbances should be learned.

4. Course Objective(s)

Students should be able to understand the pathoplogy of various diseases through the experience of clinico-pathological procedures in the hospital and the experimental exercises in the laboratory.

5. Format

Small group instruction will be mainly performed to facilitate free discussion between participants and instructors.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Topics on the morphogenesis and functional expression in organogenesis and regulatory mechanisms of organ functions will be introduced and lectured. Then, the discussion will be performed on morphological findings and changes of organ functions in physiological aging process and various diseases from the standpoint of morphology, immunopathology genetics, virology, and molecular biology.

Available programs:

Lecture irregular
Special Lecture irregular
Seminar Tuesday 19:00 ～
Journal Club Tuesday 8:00 ～
Progress meeting Friday 9:30 ～

Practice

Goals/outline:
To clarify pathogenesis of various diseases from many points of view, students will practice pathological, molecular biological and immunological procedures of analytical methods using surgical specimens, autopsy materials and samples from animal model systems.

Available programs:

Macroscopic pathological diagnosis course Tuesday 9:30
Clinico-pathological conference Tuesday 17:00
Pathological conference on neurosurgical specimens 1st Monday 18:00
Pathological conference on breast tumors 2nd Monday 18:00
Pathological conference on gynecological specimens 3rd Monday 18:00
Pathological conference on gastrointestinal specimens irregular
Pathological conference on kidney biopsy Tuesday 16:00
Pathological conference on bone/soft part tumors irregular

Lab

Goals/outline:
To clarify pathogenesis of various diseases, pathological, molecular biological and immunological analysis will be performed using biopsy samples, surgical specimens and autopsy materials. Experimental approach will also be developed for determining organogenesis and functional development of various organs as well as aging phenomena and pathogenesis of specific diseases.

Available programs:

Participation in project groups below at any time
Projects
1) Analysis of the pathogenesis of retrovirus-induced leukemia and development of the therapeutic model against leukemia
2) Molecular pathological analysis of myelodysplastic syndromes
3) Molecular pathological analysis of cancer progression
4) Molecular pathological analysis of hematological malignancies
5) Molecular pathological analysis of drug-resistance in tumor cells
6) Experimental approach for the mechanisms of leukemogenesis using animal models

7. Grading System

Performance will be generally evaluated considering the content of research reports, presentation status at the meeting or seminar, publication and so on.

8. Prerequisite Reading

Review the studies/lectures/practices of pathology duting the under-graduate education.

9. Reference Materials

Robbins Basic Pathology: with STUDENT CONSULT Online Access, 9e (Robbins Pathology), Robbins and Cotran Review of Pathology, 3e (Robbins Pathology)

10. Important Course Requirements

Nothing particular.

11. Availability in English

Available.

12. Office Hour

Please contact Prof. Masanobu Kitagawa. E-mail masa.pth2@tmd.ac.jp

13. Note(s) to students

The number of students is not limited.

Molecular Oncology

Lecture	(code:	7 7 2 1	1st year	:6units)
Practice	(code:	7 7 2 2	1st～2nd year	:4units)
Lab	(code:	7 7 2 3	2nd～3rd year	:8units)

1. Instructor(s)

Professor Shinji TANAKA
Associate Professor Yoshimitsu Akiyama, Hiroshi FUKAMACHI
Assistant Professor Shu SHIMADA

2. Classroom/Lab

M&D tower 18th floor

3. Course Purpose and Outline

To understand the molecular mechanisms underlying carcinogenesis and cancer progression in patients

4. Course Objective(s)

To understand the basic mechanisms underlying carcinogenesis and malignant progression for clinical appolication of cancer prevention, diagnosis and treatment

5. Format

Small group lesson

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To understand the molecular mechanisms underlying carcinogenesis malignant progression for clinical appolication of cancer prevention, diagnosis and treatment

Available programs:

Lecture:	Every Thursday 16:00-17:00
Special Lecture:	ad hoc
Seminar:	ad hoc
Journal Club:	ad hoc

Practice

The students present their own research data and introduce important papers from newly-arrived journals, which will be thoroughly discussed

Available programs:

Cancer Bioinformatics Conference: Every Monday 19:30-20:30
Cancer Clinical Conference: Every Wednesday 7:00-8:00

Lab

Goals/Outline:
To learn the basic scientific techniques necessary for pursuing cancer research

Available programs:

PCR, RNA analysis, Western blotting, cell culture, DNA transfection

7. Grading System

To assess achievements in Lecture, Practice, Lab and Conference by reports and examinations

8. Prerequisite Reading

Robert A. Weinberg: The biology of cancer. 2013, Garland Science.
Related original papers

9. Reference Materials

Robert A. Weinberg: The biology of cancer. 2013, Garland Science.

10. Important Course Requirements

N/A

11. Availability in English

Available

12. Office Hour

Contact person: Shinji Tanaka E-mail tanaka.monc@tmd.ac.jp

13. Note(s) to students

None

Surgical Pathology

Lecture	(code:	7 7 3 1	1st year	:6units)
Practice	(code:	7 7 3 2	1st～2nd year	:4units)
Lab	(code:	7 7 3 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person:Associate Professor Akashi Takumi E-mail akashi.path@tmd.ac.jp

2. Classroom/Lab

Lectures, practice, and lab are conducted at B-5floor Pathology center.

3. Course Purpose and Outline

The purpose of this programme is to acquire how to morphologically diagnose both neoplastic and non-neoplastic diseases. In addition, it is also very important to recognize the limitations and problems of morphological diagnosis and to learn the morphological and molecular methods which are necesssary for the resolution of the problems.

4. Course Objective(s)

Diagnose both neoplastic and non-neoplastic diseases accoding to the guidelines. Acquire the morphological and molecular methods which are necesssary for the resolution of the problems.

5. Format

Both practical and laboratory exercises are conducted by small members of students when a clinical specimen is available. Students should notify us what method(s) they wish to learn beforehand we will contact them when the time comes.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The goal is to understand the definition, patho-physiology, classification, anatomical findings including immunohistochemistry, and differential diagnosis of the neoplastic and non-neoplastic diseases.

Available programs:

Lecture occasionally
Special Lecture occasionally (twice a year)
Seminar occasionally
Journal Club Every tueday 8:30-9:00
Surgica pathology Conference Every tueday 14:00-14:30
Autopsy macroscopical Conference Every tueday 9:30-10:30
Autopsy microscopical Conference Every tueday 17:00-18:00
Respiratory surgery- Pathology conference Every Wednesday 17:00-17:30
Neurosurgery-Pathology conference Once a month (first Monday) 18:30-19:30
Breast surgery-Pathology conference Once a month (second Monday) 18:30-19:30
Dermatology- Pathology conference Once a month (fourth Monday) 18:30-19:30

Practice

Goals/Outline:
The goal is to understand the practice of surgical pathology (how to diagnose a disease and prepare reports) and propose problems concerning to diagnosis and patho-physilogy of the diseases.

Available programs:

Lab

Goals/Outline:
The goal is to acquire the various methods including morphological and molecular biological technologies to carry out research.

Available programs:

1) Preparation of light microscopic specimens
2) Method of immunohistochemistry
3) Preparation and observation of electron microscopic specimens
4) DNA and RNA preparation from fresh and paraffin-embedded tissues and realtime-PCR analysis
5) FISH analysis of paraffin-embedded specimens
6) Flowcytometry analysis of malignant lymphoma

7. Grading System

The results are assessed accoding to the situation of participation to the lecture, practice, and lab (30point), the quality of the reports (50point), and presentation and publishment of the research works (10point). The report is a part of the practice and should be prepared at the time of the practice with advice of the instructors.

8. Prerequisite Reading

Please refer to the following texts. It is also recommended to know which morphological methods is necessary for the research of the participant.

9. Reference Materials

WHO: Cllasification of tumors AFIP: Atlas of the tumor and non-tumor pathology

10. Important Course Requirements

Not particular

11. Availability in English

yes

12. Office Hour

Monday-Friday, 9:00-17:00, Contact person:Associated Professor Akashi Takumi, Tel 03-5803-5660, E-mail akashi.path@tmd.ac.jp

13. Note(s) to students

The number of participants are not limited, however, two members are desirable in each practice and lab.

Experimental Animal Model for Human Disease

Lecture	(code:	7 7 4 1	1st year	:6units)
Practice	(code:	7 7 4 2	1st～2nd year	:4units)
Lab	(code:	7 7 4 3	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Professor : Masami Kanai E-mail mkanai.arc@cmn.tmd.ac.jp

2. Classroom/Lab

Please contact the instructor in charge before the course.

3. Course Purpose and Outline

Aim of this cource is to comprehensively understand the research fields using disease model animals. The instructor will give introductory lectures about planning of experiments using experimental animals and methods of analyses based on anatomy, molecular biology and genetics.

4. Course Objective(s)

Course objectives are to understand mechanisms of pathogenesis in desease model animals created by gene mutations and to learn basic skills for experimental animal research.

5. Format

Lecture, group discussion and experiments

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Translational research, the bridge of bench to bedside, requires experiments not only with stem cells such as ES cells and iPS cells but also with experimental animals. Our goal is to understand the research activities includes the analysis of morphology and genetics with disease model animal, especially focusing on embryonic development in a comprehensive and systematic fashion.

Available programs:

Special Lecture To be announced
Seminar To be announced

Practice

Goals/Outline:
The purpose of our Practice is to learn how to plan experiments, how to analyze and interpret scientific results. In journal club, students will develop skills in reading, presenting and reviewing a research paper that has a high impact and quality in a life science field. For own research, students will weekly discuss about results and future plans in a progress report session. Students also will present their research summary every half-year as a practice for oral talk in a conference.

Available programs:

Progress report Monday 10:00-11:00
Journal Club Thursday 17:30-18:30
Conference Twice a year (August and February)

Lab

Goals/Outline:
Our lab provide an opportunity to learn the developmental biology through the analyses of mutant cell lines and mice as an animal models for human diseases. We analyze mice showing abnormality in the neonatal hepatitis and causal components, angiogenesis (generation of new vessels) and folliculogenesis (oocyte and follicle development in ovary), by using the variety of methods such as morphology, developmental biology, biochemistry and molecular biology. Students acquire those basic experimental skills with cell lines and animal, and find and study their own theme. We encourage and support students to make an entire experiment plan to reach the understanding molecular/cellular mechanism revealing individual development and disease.

1) Molecular biological analysis of organ formation using knockout mice and knockout ES cells.
2) Application of Sox17 mutant mice as the animal model for endocrine disease.
3) Analysis of mouse model for angiogenesis and organogenesis defect after birth
4) Analysis of folliculogenesis using disease-model mouse for premature ovarian failure

Available programs:

To be announced

7. Grading System

Attendance rate and presentation
Class Participation/Contribution 70%
Presentation：30%

8. Prerequisite Reading

Understanding the basic biology and the developmental biology

9. Reference Materials

"The Developing Human", 10th edition (Moore & Persaud & Torchia).
"HISTOROGY, a text and atlas", 6th edition (Ross & Pawlina)

10. Important Course Requirements

NA.

11. Availability in English

Available

12. Office Hour

Please contact Prof. Masami Kanai-Azuma, VDM, PhD. (Dept. Experimental Animal Model for Human Disease)
E-mail mkanai.arc@cmn.tmd.ac.jp

13. Note(s) to students

Nothing special

Signal Gene Regulation

Lecture	(code:	７７５１	1st year	:6units)
Practice	(code:	７７５２	1st～2nd year	:4units)
Lab	(code:	７７５３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Masataka Nakamura　　E-mail　naka.gene@tmd.ac.jp

2. Classroom/Lab

Research Center for Medical and Dental Sciences, Building 8 South (4F - 6F)

3. Course Purpose and Outline

Learning molecular genetics through T cell dynamic function in lecture and seminar

4. Course Objective(s)

The primary goal of this course is to understand implication of signal transduction in proliferation and transformation of human T cells.

5. Format

Lecture and seminar

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lab Practice　August and February (four days each)
Journal Club　Thursday 12:30 - 13:30

Lecture

Goals/outline:
　Lecture and seminar on regulation of cellular signals involving cell proliferation, differentiation and motility. The primary goal of this course is to understand implication of signal transduction in proliferation and transformation of human T cells.

Lab Practice

Goals/Outline:
　To learn and handle recombinant DNA molecules, pacipitants will carry out experiments of identification of genes and their mutation.

Available programs:

Twice in a year

7. Grading System

Comprehensive evaluation

8. Prerequisite Reading

Reviwe of Mendelian genetics

9. Reference Materials

An Introduction to Genetic Analysis

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Week days 9:00 am- 6:00 pm

13. Note(s) to students

Lecture and practice are given in English with exception.

Biofunctional Molecular Science

Lecture	(code: 7761	1st year	:6units)
Practice	(code: 7762	1st～2nd year	:4units)
Lab	(code: 7763	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Tomoya Hirano
Contact Person: Tomoya Hirano E-mail hira.chem@tmd.ac.jp

2. Classroom/Lab

Lecture and Special Lecture: Seminar room at Institute of Biomaterials and Bioengineering
Others: Laboratories and rooms of our research group at Institute of Biomaterials and Bioengineering

3. Course Purpose and Outline

The objective of this course is the developmepnt of functional molecules, which can "regulate" or "measure" the physiological functions.

4. Course Objective(s)

Through this cource, the students are expected to learn the knowledge and train the experimental technique related to the development of the functuonal molecules.

5. Format

Participation, discussion and debate with lecturer and other students

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Functional molecules, which can “regulate” or “measure” the physiological functions, such as enzyme inhibitors and fluorescent sensors are especially useful for elucidating signal transduction pathway. In this class, students are expected to study and learn the strategy for the development of such molecules. In addition, this class also focuses on the development of novel drug and diagnostic tools for various diseases.

Available programs:

Lecture: 15:00 – 18:00, Tuesday
Special Lecture: 4 – 5 times per year
Seminar: 15:00 – 18:00, Tuesday
Journal Club: 15:00 – 18:00, Tuesday
Conference: 4 – 5 times per year

Practice

Goals/Outline:
Biofunctional Molecular Science covers several aspects of organic chemistry, analytical chemistry, medicinal chemistry and chemical biology. Through this course, students are expected to understand the experimental techniques related to those area of research.

Available programs:

Seminar: 9:30 – 12:00, Saturday

Lab

Goals/Outline:
Students participate in our research group, and do some experiments related to this class.

Available programs:

Participation in our research group

7. Grading System

Grating is based mainly on attendance on Lecture, Practice and Lab. Progress of research project performed by student is also considered.

8. Prerequisite Reading

Students are expected to learn chemistry, especially organic chemisty.

9. Reference Materials

"Chemical Biology" L. Schreiber, T. Kapoor, G. Wess Ed.,、WILEY-VCH

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Monday - Friday: 9:00 - 21:00; Satureday: 9:00 - 18:00

13. Note(s) to students

Almost all lectures are performed in English.

Biomedical Devices and Instrumentation

Lecture	(code: 7781	1st year	:6units)
Practice	(code: 7782	1st～2nd year	:4units)
Lab	(code: 7783	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Prof. Kohji Mitsubayashi E-mail: m.bdi@tmd.ac.jp

2. Classroom/Lab

Room 3, Dept. of Biomedical devices and instrumentation (Institute of Biomaterials and Bioengineering, 5th floor)
Conference room 2 (Institute of Biomaterials and Bioengineering, BLDG 22)

3. Course Purpose and Outline

In advanced medicine, technologies enabling to accurately measure biological information are highly demanded. The development of "human-friendly" non-invasive measurement methods could release patients from the pain and the risks of sampling. The students will learn the basic knowledge and skills of biological information measurement through the lectures, seminars and practical training. Especially research including biochemical measurement, the development of biosensing devices and their applications to medicine will be carried out based on "sensor and biomedical engineering"

4. Course Objective(s)

The students will learn the basic technology related to advanced medicine and biological information measurement. Through practical training, they will also engage in research activities for biochemical measurement, the development of biosensing devices and their applications to medicine based on "sensor and biomedical engineering".
The objective of this course is to help the students be able to think about and conduct a research by themselves throughout the activities with academic researches.

5. Format

This course is taught in an on-the-job training style. You will attend a research project on advanced biomonitoring under the direction of the research staffs.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The lecture is designed to provide a basic understanding of both biosensing devices and bioinstrumentation for advanced medicine. You will learn principles, methods and applications of advanced biomonitoring techniques in detail.

Available programs:

Lecture As needed
Special Lecture As needed
Seminar As needed
Journal Club Monday 17:00-18:30

Practice

Goals/Outline:
This session is conducted in presentation, discussion and recitation format. You will learn actual device development and scientific method of solving problem with guidance by biosensors / bioinstrumentation experts.

Available programs:

Conference Thursday 13:30-15:00
Technical practice As needed

Lab

Goals/Outline:
We will start with some training sessions (research planning equipment operation, data processing) and then you join one of the research projects on biomedical devices and medical applications.

Available programs:

7. Grading System

The overall grading scheme is based on your participation and the final project.

8. Prerequisite Reading

Basic knowledge of biochemistry and bioengineering, English skill, Basic PC skill for research training

9. Reference Materials

Chemical Sensors and Biosensors: Fundamentals and Applications, F.G. Banica, Wiley, ISBN-13: 978-0470710678
Biosensors: Essentials, G. Evtugyn, Springer, ISBN-13: 978-3642402401

10. Important Course Requirements

None

11. Availability in English

Avaiable

12. Office Hour

Contact: Prof. Kohji Mitsubayashi E-mail m.bdi@tmd.ac.jp

13. Note(s) to students

Welcome the students interested in biosensors and biomedical devices. Please contact the instructor.

Medical Instrument

Lecture	(code:	７７９１	1st year	:6units)
Practice	(code:	７７９２	1st～2nd year	:4units)
Lab	(code:	７７９３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Fumimasa NOMURA
Contact person: Associate Prof. Fumimasa NOMURA　Tel 5280-8173　E-mail nomura.bmi@tmd.ac.jp

2. Classroom/Lab

Lab. Room 2 of Department of Biomedical Information (IBB building 4th floor)

3. Course Purpose and Outline

The purpose of this course is to study bio-engineering, mechanical engineering, electronic electrotechnology, nano micro science, information science as these studies are essential to understand most advanced bio-device and system. Furthermore to master skills to understand and utilize knowledge and technique of comprehensive biomedical science and engineering through understanding of biomedical device system which is actually in practical use.

4. Course Objective(s)

To understand basics of comprehensive science and engineering in the biomedical area and to promote awareness on science and engineering of this field.

5. Format

Students should attend both of the seminar style lecture and the practical experiments.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

In order to develop and design medical instrument, it is required to express engineeringwise living phenomenon and living features which the instrument is aimed for, to understand physicochemical principles which the instrument utilises, etc. Necessary engineering theory for this purpose will be explained and moving mechanism of advanced medical instruments will be described.

Available programs:

Practice

Master computer signal processing such as time-serie signal and image information, information processing, various simulation technique, numerical calculation method, etc.

Available programs:

Lecture will be done as a seminar style with paper review and discussion.

Lab

Design instument on a specific sample, confirm movement by simulation, and produce parts if possible.

Available programs:

A series of practical experiment. Students can choose one of the following two programs:
1) On-chip cell network fabrication and measurement
2) Quasi in vivo preclinical cardiotoxycology screening

7. Grading System

Grading will be determined by participation in discussions, practices, lab works, presentations and talks. In addition, comprehensively evaluated based on research contents, involvement in various researches and meetings, conference presentations, etc.

8. Prerequisite Reading

Instructed at the guidance which will be taken place at the first class, and at each class if necessary.

9. Reference Materials

Informed at the class if necessary.

10. Important Course Requirements

None

11. Availability in English

None

12. Office Hour

Contact person: Associate Prof. Fumimasa NOMURA Tel 5280-8173 E-mail nomura.bmi@tmd.ac.jp

13. Note(s) to students

Animal Experiment: Students are expected to learn how to culture hES/hiPS cell-delivered cells on the biochips. Animal experiments are not planned in these subjects.

Biomechanics

Lecture	(code:	７９６１	1st year	:6units)
Practice	(code:	７９６２	1st～2nd year	:4units)
Lab	(code:	７９６３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Kenji Kawashima, Assistant Professor: Takahiro Kanno
Contact person: Kenji Kawashima. Email:kkawa.bmc@tmd.ac.jp

2. Classroom/Lab

Department of Biomechanics at Institute of Biomaterials and Bioengineering

3. Course Purpose and Outline

The purpose of the course is to learn basic technologies to design and develop medical devises based on biomechanins.

4. Course Objective(s)

Master the basic knowledge of mechanical design, robotics and control engineering.

5. Format

Lecture, Seminar, Practice and Experiment

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The object of this lecture is to provide the ability to design and develop medical devices based on biomechanics, which studies the structure and function of biological systems, with mechanical dynamics, robotics and control engineering.

Available programs:

Lecture As occasion demands
Special Lecture As occasion demands
Seminar As occasion demands
Journal Club As occasion demands

Practice

Goals/Outline:
Learn about mechanical design and control engineering for medical devices based on biomechanics. Master a basic skill to develop the devices from the researchers and engineers working on the medical devices and systems. Learn the basic control method of a surgical robot using a personal computer.

Available programs:

Conference Monday 14:00 -16:00
Surgical robot control: as occasion demands

Lab

Goals/Outline:
Learn basic skill to evaluate the medical devices such as robotic surgery system. Practice computer programming, and execute some experimental research related to surgical robot.

Available programs:

Experiment as occasion demands

7. Grading System

Grading will be based on progress reports on their studies and presentations at meeting as well as lectures, practices and experiments.

8. Prerequisite Reading

It is recommended to have basic knowledge of the mechanical engineering.

9. Reference Materials

Reference papers will be handled in the lecture.

10. Important Course Requirements

Welcome students interested in medical deivces and robotics.

11. Availability in English

Available

12. Office Hour

Monday to Friday (except holidays) 9:30-18:00

13. Note(s) to students

Biointerface Engineering

Lecture	(code: ７８１１	1st year	:6units)
Practice	(code: ７８１２	1st～2nd year	:4units)
Lab	(code: ７８１３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Akira Matsumoto TEL: 03-5280-8098 E-mail: matsumoto.bsr@tmd.ac.jp

2. Classroom/Lab

Dept. of Bioelectronics, Room #6 (4th floor) and Seminar Room (3rd floor), Institute of Biomaterials and Bioengineering

3. Course Purpose and Outline

Design of interfaces is a determinant for the interaction between materials and biological substances (cell, tissues and etc.) and is central to successful measurement and control of biomolecules with desired sensitivity and efficiency. The course aims to train one's skills to engineer and evaluate bio-interfaces from a viewpoint of materials science.

4. Course Objective(s)

Train skills to design and engineer bio-interfaces at scales of molecules and higher, taking advantage of both top-down and bottom-up approaches.

5. Format

After trained for basic handling of biological samples and instruments, join a research group of a mentor.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Serum components play crucial roles in metabolic cycles and their concentration homeostasis reflects dynamic equilibrium of life. On occasion of abnormal metabolic pathway, it is manifested as a fluctuation of each specific serum component. This lecture provides an overview of advanced materials and engineering aimed at determination of body fluids including serum components and mechanisms for their concentration homeostasis.

Available programs:

Lecture As occasion calls
Special Lecture As occasion calls
Seminar As occasion calls
Journal Club Every Wednesday 17:00-18:00
Conference As occasion calls

Practice

Goals/Outline:
Learn detection principles for various serum components, theory, characteristics and other application. Familiarized with the state-of-the-art technology, knowledge and publications along with discussion on the challenges and further needs.

Available programs:

Seminar Every other week Mondays 13:00-15:00
Publication Search As occasion calls

Lab

Goals/Outline:
Handling of biological components including nucleotides, proteins and cells. Obtain skills for analysis and measurement of cell functions. Familiarized with other related techniques, lab activities including planning of experiments, analysis and discussion.

Available programs:

Molecular biology, Cell Engineering As occasion calls
Optical and Electrical Measurements As occasion calls
Fabrication of device As occasion calls

7. Grading System

Participation in lectures, lab practice, presentation and report.

8. Prerequisite Reading

Not applicable

9. Reference Materials

Not applicable

10. Important Course Requirements

Not applicable

11. Availability in English

Available

12. Office Hour

From 10 Am to 6PM

13. Note(s) to students

Not applicable

Material Biofunctions

Lecture	(code:	７９７１	1st year	:6units)
Practice	(code:	７９７２	1st～2nd year	:4units)
Lab	(code:	７９７３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Akiko Nagai, Assistant Professor: Kosuke Nozaki
Contact person: Akiko Nagai TEL 5280-8168 E-mail: nag-bcr@tmd.ac.jp

2. Classroom/Lab

Department of Material Biofunctions, Institute of Biomaterials and Bioengineering
http://www.tmd.ac.jp/i-mde/www/index.html

3. Course Purpose and Outline

Main objective in this graduate course is to provide students opportunity to study the reaction mechanism between materials and living tissues. Students are also taught on investigation of development of new surface modification processes of biomaterials to acquire tissue-affinity.

4. Course Objective(s)

The objective and principle of this graduate course is to educate students with materials knowledge demanded to medical and dental doctors who are leading medical professionals and bioscientists who are capable of carrying out their own research at an international level in the area of their special fields of science, respectively.

5. Format

Small group

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The objective and principle of the department of Material Biofunctions is to educate students with materials knowledge demanded to medical and dental doctors who are leading medical professionals and bioscientists who are capable of carrying out their own research at an international level in the area of their special fields of science, respectively. Main objective in this graduate course is to provide students opportunity to study the reaction mechanism between materials and living tissues. Students are also taught on investigation of development of new surface modification processes of biomaterials to acquire tissue-affinity.

Available programs:

Lecture Thursday
Special Lecture A/N
Seminar A/N
Journal Club Friday
Conference Thursday

Practice

Goals/Outline:
We have developed educational programs which enable students to acquire interdisciplinary and extensive material knowledge, while cultivating a research-oriented mindset. Students are taught to understand research trends and opinions on biomaterials.

Available programs:

Lab seminar: Thursday (16:00-17:30)
Journal Club: Friday (10:00-12:00)

Lab

Goals/Outline:
We have developed our existing curriculum significantly so that students can, through tutorials, acquire not only extensive material knowledge but also advanced research skills.

Available programs:

Experiment (Synthesis of ceramic powder, making of ceramics and biological assessments): A/N

7. Grading System

Assessment on the final examination or report

8. Prerequisite Reading

We will prepare them.

9. Reference Materials

We will prepare them.

10. Important Course Requirements

We ask for a highly-motivated student.

11. Availability in English

None

12. Office Hour

Thursday 10:00-12:00

13. Note(s) to students

We desire participation of highly-motivated students.

Genetic Regulation

Lecture	(code:	７８３１	1st year	:6units)
Practice	(code:	７８３２	1st～2nd year	:4units)
Lab	(code:	７８３３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Prof. Akinori KIMURA　　E-mail　akitis@tmd.ac.jp

2. Classroom/Lab

To be announced upon contacting to the instructor.

3. Course Purpose and Outline

The purpose of this course is to deeply undersstand the genetic regulation of phenotype inclusings disease susceptibility and pathogenesis in humans and animal models. For this purpose, literatures reporting the genetic approaches and molecular investigations on the diseases are used for education of genetics of disease and related discussion.

4. Course Objective(s)

To undestand the genetic regulation of pathogenesis from the viewpoint of diversity in genome structure and gene expression and to apply the knowledge in developing novel strategy for diagnosis, treatment and prevention of human diseases.

5. Format

Studies will be done based on the problem oriented learning.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　Both genetic factor and environmental factor are known to interact in the pathogenesis of human diseases. The genetic factor itself is mainly determined by diversity in human genome. In this course, the concept of human genome diversity and its involvement in the pathogenesis of human diseases, especially the intractable diseases, will be lectured for better understanding of human genome research and its use in the development of novel diagnostic, therapeutic and/or preventive methods for the intractable diseases.

Available programs:

Lecture　Monday 15:00-18:00
Special Lecture　Thursday 17:00-18:00
Seminar　Monday 14:00-15:00
Journal Club　Thursday　16:00-17:00

Practice

Goals/Outline:
　To learn about the method to analyze the human genome diversity and to practice the experimental planning for the identification and proving the involvement of disease-related human genome information. In addition, analysis and discussion about the experimental data will be provided.

Available programs:

Data meeting　Monday 13:00-15:00
Practical discussion Monday 14:00-16:00

Lab

Goals/Outline:
Identification of the disease-associated human genome diversity for cardiovascular diseases, autoimmune diseases, malignant tumors, and infectious diseases will be performed. In addition, functional alterations caused by the disease-associated human genome diversity will be investigated in vitro by using genetic, molecular biological, biochemical, and cell biological methods as well as in vivo by establishing genetic engineered mice. These research projects will be done for developing novel diagnostic, therapeutic and preventive methods for the diseases.

Available programs:

Genetic regulation of disease pathogenesis course: Tuesday, Wednesday, Friday 10:00-17:00
Experimental course: Participation is available upon request. Five days per year 10:00-17:00, Details will be announced upon participation

7. Grading System

Grading is based on evaluation by oral examination, data presentation, discussion and research performance including presentation in scientific meetings. Reports on specific issue (thema will be announced) will be manded when it will be needed for evaluation of grade.

8. Prerequisite Reading

Basic principles of genetics should be obtained. Following public databases are useful in understanding the outline of genetics and genome diversities in humans: OMIM (Online Mendelian Inheritance in Man)、HGMD (Human Genome Mutaion Database)、HGVD (Human Genome Variation Database).

9. Reference Materials

Principles of Medical Genetics (Thomas D. Gelehrter, Francis S. Collins eds), Williams &Wilkins

10. Important Course Requirements

No particular issues.

11. Availability in English

Available upon request.

12. Office Hour

Contact by Email (akitis@mri.tmd.ac.jp) is available anytime.

13. Note(s) to students

Small group studies with less than 5 students.

Bioinformatics

Lecture	(code:	1st year	:6units)
Practice	(code:	1st～2nd year	:4units)
Lab	(code:	2nd～3rd year	:8units)

1. Instructor(s)

2. Classroom/Lab

Not offered

Applied Gene Medicine

Lecture	(code:	７８５１	1st year	:6units)
Practice	(code:	７８５２	1st～2nd year	:4units)
Lab	(code:	７８５３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Yoshio Miki,
Contact person: Yoshio Miki　　E-mail　miki.mgen@mri.tmd.ac.jp

2. Classroom/Lab

Confirm it to the instructor before attending a lecture because it differs by the program.

3. Course Purpose and Outline

The purpose of this course is to understand basic molecular mechanisms from cancer development to invasion and metastasis so that you may apply the knowledge for future developments of novel diagnosis and treatment. Studying the current cancer research including oncogene/tumor suppressor gene, cancer stem cell and cancer microenvironment network, you will learn life science and a variety of cellular functions.

4. Course Objective(s)

To understand the latest findings in cancer research from cancer development to invasion and metastasis.
To devise a research subject, which is translational to clinical use, and design appropriate experiment plan and future plan based on your objective judgment on progress of your study.

5. Format

Lecture in a group of a few people. To urge the student's lively participation, a lot of opportunities for questions and debatings are set as much as possible.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
　Cancer is a genetic disease and the study of not only a sporadic tumor but also a hereditary tumor has contributed to the understanding of carcinogenic mechanism greatly. Carcinogenesis is a multistep process in which cells accumulate multiple genetic alterations as they progress to a more malignant phenotype. We lecture on molecular mechanism of the carcinogenesis and diversity of the cancer based on these points of view.

Available programs:

Lecture　every Thursday 16:00-17:00
Special Lecture at any time
Journal Club every Tuesday　10:00-12:00

Practice

Goals/Outline:
　Aiming to acquire fundamental knowledge and basic skills, such as molecular biology, histochemistry, microbiology, and molecular medicine in order to accomplish the above-mentioned purpose,

Available programs:

Participation in a research group　at any time

Lab

Goals/Outline:
Searching for the genes which mutate in process of carcinogenesis. DNA and RNA are extracted from human clinical samples, and the changes on the primary structure of genes and transcripts are screened. Based on the information, carcinogenic mechanism is examined.

Available programs:

Participation in a research group at any time

7. Grading System

We evaluates overall based on the participation situation and the research content to the lecture, the practice, and the experiment.

8. Prerequisite Reading

You are required to search and read through scientific papers relevant to your research or ones selected by the instructor.

9. Reference Materials

Robert A. Weinberg, The Biology of Cancer, Garland Science (English/Japanese)
Bruce Alberts et al., Molecular Biology of the Cell, Garland Science (English/Japanese)

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

10:00-17:00

13. Note(s) to students

Welcome the students interested in cancer research and the carcinogenic mechanism. Please contact the instructor.

Molecular Cytogenetics

Lecture	(code:	7861	1st year	:6units)
Practice	(code:	7862	1st～2nd year	:4units)
Lab	(code:	7863	2nd～3rd year	:8units)

1. Instructor(s)

Professor Johji Inazawa M.D., Ph.D.
Lector Jun Inoue Ph.D.
Assistant Professor Tomoki Muramatsu Ph.D.
Contact person: Johji Inazawa TEL 03-5803-5820 E-mail johinaz.cgen@mri.tmd.ac.jp

2. Classroom/Lab

A lecture room is different in a program, so check it for staff beforehand.

3. Course Purpose and Outline

Human genome have been revealed by The Human Genome Project in 2003. Consequently, in the present, personalized medicine will become reality using genome imformatoin. It is essential to have the knowledge of medical genomics for development of medical and dental research including diagnosis, cure and prevention of diseases. This lecture instructs not only the basic knowledge and the research technic of medical genomics but also the pathological mechanism of diseases, are caused by the disruption of biological phenomenon, such as genome and epigenome alteration.

4. Course Objective(s)

The acquirement of knowledge of basic and leading-edge medical genomics and bioethics.
The understanding of pathogenic mechanism, diagnosis, cure and prevention in several diseases.

5. Format

Individual guidance in principle.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The principal aim of Department of Molecular Cytogenetics (MCG) is to understand the molecular mechanism underlying cancer and genetic diseases including congenital disorders. Our research interests are as follows; (1) Identification of genes responsible for cancer and unknown genetic diseases, (2) Development of innovative techniques for detection of genomic and epigenomic aberrations underlying the pathogenesis of cancer and genomic disorders, and (3) Establishment of practically useful tools for diagnosis in Personalized Medicine of cancer and intractable diseases. It is our goal to bridge the gap between basic and clinical research for the benefit of each of the patients.

Available programs:

Lecture Anytime
Special Lecture Anytime
Seminar Anytime
Journal Club Weekly Monday 9:00 - 11:00
Conference Anytime

Practice

Goals/Outline:
The main purposes of our practice are understanding and acquisition about various technologies of genomic/epigenomic analysis, functional analysis, cell biological analysis and biochemical analysis in the scientific research for cancer and genomic disorders.

Available programs:

Progress Meeting　Weekly Saturday 9:00 - 12:00

Lab

Goals/Outline:
1) Identification of cancer-related genes, including microRNAs, by genomic and epigenomic approaches, and characterization of these genes using in vitro/ in vivo experimental models reproducing characteristic aspects and behaviors for human cancers; e.g. uncontrolled excess of cell growth, metastasis, epithelial-mesenchymal transition (EMT), and altered autophagy.
2) Molecular cytogenetic investigation of genomic disorders including multiple congenital anomalies and intellectual disability (MCA/ID) using integrative genomics and epigenomics.
3) Development of innovative techniques for genomics and/or epigenomics in medical sciences.

Available programs:

Anytime

7. Grading System

Evaluated based on the following points;
1) Attitude for study, i.e. the independence of mind.(40%),
2) Progress situation in own research and record of attendance at weekly seminar and the meeting for research in progress. (40%)
3) Presentation of progress and results of own research and introduction of journal articles in seminar.(20%)

8. Prerequisite Reading

None

9. Reference Materials

1. The Biology of Cancer. Weinberg RA. Garland Science, Taylor & Francis Group 2nd Ed. 2013.
2. Human Molecular Genetics. Strachan T.& Read AP. Bios Scientific Publisher 2nd Ed. 1999
3. 遺伝子医療革命－ゲノム科学が私たちを変える フランシス・S？コリンズ著 矢野真千子訳、2011 (NHK出版)
4. Thompson&Thompson Genetics in Medicine,7th Edition. Nussbaum R et al. Saunders.
5. 遺伝医学 やさしい系統講義18講 監修 福嶋義光、編集 第55回日本人類遺伝 学会大会事務局 2013 (メディカル・サイエンス・インターナショナル)

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

Contact: Department of Molecular Cytogenetics, Johji Inazawa　TEL 03-5803-5820　E-mail johinaz.cgen@mri.tmd.ac.jp

13. Note(s) to students

No limited about the number of applicants.

Biochemical Genetics

Lecture	(code:	7871	1st year	:6units)
Practice	(code:	7872	1st～2nd year	:4units)
Lab	(code:	7873	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Shigetaka Kitajima　　Assistant Professor: Junya Kawauchi
Associate Professor: Yujiro Tanaka
Contact person: Shigetaka Kitajima　e-mail: kita.bgen@mri.tmd.ac.jp

2. Classroom/Lab

Lab of Biochemical Genetics at 19 th Floor, M&D Tower

3. Course Purpose and Outline

To study the basic of biochemsitry and molecular biology/genetics and get the ability to understand updated progress in medicine

4. Course Objective(s)

To learn how you can read and understand scinetific or medical papers in English, and also to learn the techniques of basic biochemisitry/molecular genetics

5. Format

Available for a few students. Many questions and vigorous discussion are encouraged.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
To learn the basic principle of molecular biology and biochemistry, function and pathogenetic implication of disease genes in human diseases, thus establishing independent activity of reading and understanding the molecular mechanism leading to disease. Both basic biological and clinical aspects are also emphasized.

Available programs:

Lecture　　On appropriate time
Special Lecture　On appropriate time
Seminar　　On appropriate time
Journal Club　17:00~20:00 every Monday

Practice

Goals/Outline:
To learn and understand various experimental techniques in molecular biology, focusing cellular, DNA and Protein work in lab bench. Deciphering gene function using disease model animal is encouraged.

Available programs:

Journal Club and Work Progress　17:00~20:00 every Monday

Lab

Goals/Outline:
To promote understanding and get used to various experimental techniques in molecular biology, especially focusing on cellular, DNA and Protein work in lab bench. Deciphering gene function using disease model animal is also encouraged.

Available programs:

Some experiments and participation in a research group are available after interview

7. Grading System

Participation to lecture, practice, and experiment are essential.

8. Prerequisite Reading

No need to finish basic course in Medical School

9. Reference Materials

Molecular Biology of the Cell (edited by Peter Walter et al), Biochemistry (edited by Stryer)

10. Important Course Requirements

To be ambitous in basic medical science, and to be able to enjoy doing science

11. Availability in English

Available

12. Office Hour

10AM-18PM

13. Note(s) to students

English is used throughout the lecture.

Structural Biology

Lecture	(code:	７８８１	1st year	:6units)
Practice	(code:	７８８２	1st～2nd year	:4units)
Lab	(code:	７８８３	2nd～3rd year	:8units)

1. Instructor(s)

Associate Professor: Teikichi Ikura
Contact person: Structural Biology Teikichi Ikura　　E-mail　ikura.str@tmd.ac.jp

2. Classroom/Lab

Lab of Structural Biology at 22th Floor, M&D Tower

3. Course Purpose and Outline

The purpose of this course is to provide the ability to understand and analyze the relationship between structure and function of biopolymers such as proteins and nucleic acids. Students learn fundamental contents through the lecture, fundamental techniques through the practice, and then acquire various techniques essential to bioscience through lab experiments.

4. Course Objective(s)

Students acquire the ability to understand and analyze the relationship between structure and function of biopolymers such as proteins and nucleic acids.

5. Format

Every course is available for a few students. Many questions and vigorous discussion are encouraged

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The goal of this lecture is to provide the ability to understand and analyze the relationship between structure and function of biopolymers such as proteins and nucleic acids. This lecture deals with the fundamental contents on protein folding and stability, and then takes an overview on various folding-diseases such as Alzheimer's disease from the physicochemical viewpoint.

Available programs:

Lecture　As occasion demands
Special Lecture　As occasion demands
Journal Club　As occasion demands

Practice

Goals/Outline:
In this practice, students learn how to read scientific journal related to folding-diseases, and understand fundamental techniques to elucidate the inherent functions of the proteins and the mechanism of the diseases.

Available programs:

Journal Club As occasion demands

Lab

Goals/Outline:
Students learn various techniques for physicochemical study on proteins such as gene cloning, protein expression and purification, structural analysis and interaction analysis.

Available programs:

Some experiments and participation in a research group are available after interview.

7. Grading System

Attendances at lecture, practice, and experiment are obligatory.

8. Prerequisite Reading

Nothing

9. Reference Materials

biochemistry - protein folding (Author: Blake Gillespie)
http://www.youtube.com/watch?v=Hb0xzHojMBQ&list=PL9NXhuOnjHRw-jVlIjsVl2nv6xm8OWFvU

10. Important Course Requirements

Make contact with the teacher before registration.

11. Availability in English

Available

12. Office Hour

Mon.-Fri. 10:00-18:00

13. Note(s) to students

English is used throughout the lecture.

Hematology

Lecture	(code:	７８９１	1st year	:6units)
Practice	(code:	７８９２	1st～2nd year	:4units)
Lab	(code:	７８９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Osamu Miura, MD., PhD.　Lecturer: Ayako Arai, MD., PhD.
Assistant Professor: Tetsuya Fukuda, MD., PhD.
Contact person: Tetsuya Fukuda, MD., PhD.　E-mail　fuku.hema@tmd.ac.jp

2. Classroom/Lab

As different rooms will be used for each program, contact the lecturer beforehand.

3. Course Purpose and Outline

Course purpose is to understand the pathogenesis of hematological malignancies and to learn the diagnostic and therapeutic principles for these diseases. Students learn how to analyze the cellular and molecular mechanisms underlying pathogenesis of hematological malignancies and to diagnose them.

4. Course Objective(s)

Course objectives is to obtain basic skills to analyze the pathogenesis of hematological malignancies and to become able to diagnose main hematological malignancies and make appropriate therapeutic plans to treat these diseases.

5. Format

A small-group teaching system and discussions with the participants.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Normal functions and abnormalities of proto-oncogenes and intracellular signaling molecules that play important roles in leukemogenesis will be explained. Diagnosis and therapy of hematological malignancies based on this knowledge will be also explained

Available programs:

Lecture　As occasion demands
Special Lecture　As occasion demands
Seminar　As occasion demands
Journal Club　17:00-18:00 on Monday
Conference　17:00-18:00 on Tuesday

Practice

Goals/Outline:
Clinical and morphological features of hematological malignancies and diagnostic skills will be learned. Laboratory tests for hematological disorders and therapeutic strategies for these disorders will be also learned and practiced.

Available programs:

Clinical Conference　18:00-19:00 on Monday
Research Conference　16:00-17:00 on Thursday
Clinical Round　13:00-15:00 on Thursday
Hemato-pathological Conference　As occasion demands

Lab

Goals/Outline:
Abnormalities of proto-oncogenes and intracellular signaling molecules that play important roles in leukemogenesis will be analyzed by cellular and molecular biology methods to develop new diagnostic and therapeutic methods for hematological malignancies.

Available programs:

Participation in research groups as occasion demands.

7. Grading System

Comprehensively evaluated based on participation in each program and progress in research.

8. Prerequisite Reading

Standard reference books in hematology and basic cellular and molecular biology.

9. Reference Materials

Wintrobe's Clinical Hematology, 13th ed. (Lippincott, Williams & Willkins, 2013)

10. Important Course Requirements

Nothing in particular.

11. Availability in English

None

12. Office Hour

Friday 16:00-17:00

13. Note(s) to students

Practice and Lab courses will accept not more than 10 students.

Molecular Endocrinology and Metabolism

Lecture	(code:	７９０１	1st year	:6units)
Practice	(code:	７９０２	1st～2nd year	:4units)
Lab	(code:	７９０３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Yoshihiro Ogawa
Contact person: Takanobu Yoshimoto　　E-mail　tyoshimoto.mem@tmd.ac.jp

2. Classroom/Lab

N/A

3. Course Purpose and Outline

This training program is designed to educate and establish 'physician-scientist' in the field of endocrinology and metabolism.

4. Course Objective(s)

The research program provides mentor-based training in experimental design, laboratory and clinical research techniques and methodology, and interpretation and analysis of the results obtained from cellular and molecular biology, physiology, clinical physiology, clinical therapeutics, and health sciences.

5. Format

Small-group seminar based on discussion with mentor.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Our training program enables PhD students to prepare for their future academic and/or clinical careers in the multidiscipline of endocrinology and metabolism.

Available programs:

Lecture　N/A
Special Lecture　N/A
Journal Club　N/A
Seminar　N/A

Practice

Goals/Outline:
Our clinical training program provides for the practice through comprehensive inpatient and outpatient services in the area of endocrine and metabolic disorders.

Available programs:

Clinical conference　Monday 10:00-12:00
Ward round　　Monday 15:00-17:00

Lab

Goals/Outline:
The research program provides mentor-based training in experimental design, laboratory and clinical research techniques and methodology, and interpretation and analysis of the results obtained from cellular and molecular biology, physiology, clinical physiology, clinical therapeutics, and health sciences.

Available programs:

Participation in a research group as needed.
Research conference N/A

7. Grading System

Comprehensive evaluation based on the participation and achievement in the lecture, practice, and lab.

8. Prerequisite Reading

Depending on the program, always check supervisor in advance.

9. Reference Materials

Williams Text book of Endocrinology 12th edition (ed. Melmed S et al) published from Saunders
Joslin Diabetes Mellitus 14th edition (ed. Kahn CR et al) published from Lippincott Williamas & Wilkins

10. Important Course Requirements

N/A

11. Availability in English

N/A

12. Office Hour

contact person: Takanobu Yoshimoto (Department of Molecular Endocrinology and Metabolism)
email: tyoshimoto.mem@tmd.ac.jp

13. Note(s) to students

Hepatobiliary and Pancreatic Surgery

Lecture	(code: ７９１１	1st year	:6units)
Practice	(code: ７９１２	1st～2nd year	:4units)
Lab	(code: ７９１３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Minoru Tanabe　　E-mail　bg-secre.msrg@tmd.ac.jp

2. Classroom/Lab

Different venue depending on the specific program

3. Course Purpose and Outline

The graduates will understand various Heapto-Biliary-Pancreatic diseases and attain the ability to manage these diseasaes and the problems of patients, through clinical experiences and basic researches.

4. Course Objective(s)

Course objectives are: 1.Understanding of surgical health care system delivery to both inpatients and outpatients. 2.Learning surgical technique of Hepato-Biliary-Pancreatic surgery as an operator or assistants. 3.How to conduct clinical and/or basic research on HBP disease in collaboration with the other fields of specialists. 4.To promote skills in presentation at scientific meetings. 5.Acquisition of educational methods for junior surgeons. 6.Function as a member of the surgical team.

5. Format

Small-group guidance

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Lectures on biomolecular mechanisms of carcinogenesis, cancer growth, invasion and metastasis in digestive organs, especially liver, biliary duct and pancreas; leading to molecular target therapy. In addition, the general and advanced researches on the diagnosis and treatment of the cancers are expounded, as well as clinical and basic researches on liver transplantation.

Available programs:

Lecture　A/N
Special Lecture　A/N
Seminar　A/N
Journal Club　A/N
Conference　A/N

Practice

Goals/Outline:
Practices on methods, points of case history, physical examination, imaging diagnosis, and laboratory tests. The treatments and cares of patients are learned in accordance with the disease and cancer stages, as well as the perioperative cares and surgical techniques of liver transplantation.

Available programs:

Preoperative Conference: Every Thursday AM7:30-9:00
Postoperative Conference: Every Monday AM7:30-9:00
Surgical Operation: Every Tuesday, Thursday and Friday
Ward Round: Every Tuesday AM8:00-9:00
HBP Conference: Every Monday PM18:00-20:00
Journal Club: Every Wednesday AM8:00-9:00

Lab

Goals/Outline:
Since poorer prognosis and awful QOL are recognized generally in the patients with cancers of the digestive system, especially liver, biliary duct and pancreas, the development and clinical application of novel cancer treatments are required in this field. Furthermore, the surgical treatments in this area should require the highly skilled techniques, and the intensive cares of severe complications such as postoperative liver failure. There also remain so many problems to be solved in the liver transplantation; for example, immuno-suppression, infectious diseases and organ preservation. The mission of our researches is a breakthrough in these critical matters.

Available programs:

Participation in research groups: A/N

7. Grading System

Comprehensive evaluation system: attendance of lecture, remarks in the meetings, assessment of basic/clinical research, and number of presentation at national/international conference.

8. Prerequisite Reading

Besides knowledge of surgery and digestive surgery, comprehension of basic anatomy and physiology is required.

9. Reference Materials

Nothing in particular.

10. Important Course Requirements

Nothing in particular.

11. Availability in English

None

12. Office Hour

Contact person: Minoru Tanabe, M.D., Ph.D. Departmenent of Hepato-Biliary-Pancreatic Surgery E-mail: bg-secre.msrg@tmd.ac.jp

13. Note(s) to students

Orthopaedic and Spinal Surgery

Lecture	(code: ７９２１	1st year	:6units)
Practice	(code: ７９２２	1st～2nd year	:4units)
Lab	(code: ７９２３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Atsushi Okawa
Assistant Professor: Tsuyoshi Kato, Toshitaka Yoshii, Hiroyuki Inose
Associate Professor: Shinichi Sotome, Yoshinori Asou
Professor: Shigenori Kawabata, Lectuer Mitsuhiro Enomoto

2. Classroom/Lab

Orthopaedic Surgery Office Room, Lab room (M&D tower 11F)

3. Course Purpose and Outline

The purpose of the course is to build the students' store of knowledge concerning bone and joint disorders and spinal disorders. The students should plan and conduct experiments which will clarify the mechanisms underlying these disorders or will be valuable for developments of treatments.

4. Course Objective(s)

To build the ablity to dicover new quetsions about bone and spine disorders and to develop the ability to create research plans and execute the experiments.

5. Format

We sentence you to small number of people education of independent participation type of a graduate student.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

By reading papers of top-journals, the students should extend their knowledge concerning bone, joint and neurological disorders. Discussion about the students' research will be held in Research Progress Meeting.

Available programs:

Research Progress Meeting	7:30 - 8:30, Tuesday
Journal Club	7:30 - 8:30, Tuesday and Friday
Special Lecture	As occasion demands
Seminar	As occasion demands

Practice

Goals/Outline:
We practice findings of clinical problem of the locomotorium lesion such as joints, spine, intervertebral disc, spinal cord, peripheral nerve disorders, aging, injury, tumorigenesis mechanism, and image findings.
Through these practices we train to make the clinical diagnosis and to plan the adequate treatment.

Available programs:

Bedside Professor Round Monday 14:30-16:30
Clinical Conference Monday 7:30-9:00
Continuous Medical Education Thursday 7:30-8:00

Lab

Goals/Outline:
Molecular biologically and using physiological procedure we analyze motor of joints, spine, intervertebral disc, spinal cord, peripheral nerve disorders, aging, injury, tumorigenesis mechanism and definite how to treat these disorders. And also we would do tissue reconstruction or develop an artificial bone.

Available programs:

Participation in a research group
Research themes:
Bone and cartilage regeneration
Peripheral nerve and Spinal cord regeneration
Muscle regeneration
Bone and cartilage metabolism
Neuro physiology
Metastatic Tumor

7. Grading System

Attendance rate at each program (50%)
Progress of the research, research presentation at research meetings, research publication (50%)

8. Prerequisite Reading

Students should attend the journal clubs three times a week and review the papers read in the journal clubs.

9. Reference Materials

Students should read publications retrieved in accordance with their research themes.

10. Important Course Requirements

Not applicable

11. Availability in English

Available
However, Japanese will be basically used in most of the programs.

12. Office Hour

9:00 – 17:00

13. Note(s) to students

We welcome participation from the other lecture about a graduate school lecture, a particular lecture, a graduate school seminar.
We have several cooperation study with other section.

Diagnostic Radiology and Nuclear Medicine

Lecture	(code:	７９３１	1st year	:6units)
Practice	(code:	７９３２	1st～2nd year	:4units)
Lab	(code:	７９３３	2nd～3rd year	:8units)

1. Instructor(s)

Contact person: Ukihide Tateishi, MD, PhD　　E-mail　ttisdrnm@tmd.ac.jp

2. Classroom/Lab

Check for charge instructors beforehand, because it's different depending on programs.

3. Course Purpose and Outline

To learn principle and characteristics of various radiologic modality and correlate with anatomic and pathologic information. To establish new imaging findings or diagnostic methods and contribute to the progress of radiology and nuclear medicine.

4. Course Objective(s)

i) To learn principle of various imaging modality and explain application for each disease, and understand imaging findings theoretically. ii) To learn correlation between imaging findings and pathologic findings. iii) To learn procedure of emergent IVR.

5. Format

Small number system is employed.
A chance of discussion is held aggressively.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The principles and characteristics of various diagnostic imaging modalities are expounded. Based on the principles, the theoretical methods in interpretation of images are also expounded. And, clinical application and optimal diagnostic procedure for various diseases are also expounded.

Available programs:

Lecture　on occasion
Special Lecture on occasion
Seminar　on occasion
Journal club and Conference Wednesday morning (7:50AM) and every Friday evening (17:00PM)

Practice

Goals/Outline:
By participating in the various conferences, to learn hands-on how to infer the pathological background from the image

Available programs:

Participation in various clinical conferences Check for charge instructors beforehand

Lab

Goals/Outline:
To find new imaging findings and develop new diagnostic methods through daily practice

Available programs:

Participation in research groups on occasion

7. Grading System

Estimated overall based on the participation situation to the lectures and the practices and the study contents.

8. Prerequisite Reading

Capability for cross-sectional normal anatomy and basic knowledge of radiation exposure

9. Reference Materials

N/A

10. Important Course Requirements

N/A

11. Availability in English

Availuable

12. Office Hour

9:00AM-17:00PM, Monday to Friday

13. Note(s) to students

No number limitation.

Disease Genomics

Lecture	(code:	７９８１	1st year	:6units)
Practice	(code:	７９８２	1st～2nd year	:4units)
Lab	(code:	７９８３	2nd～3rd year	:8units)

1. Instructor(s)

Professor　Shumpei Ishikawa M.D., Ph.D.
Assistant Professor　Takayuki Isagawa Ph.D.・Hiroto Katoh M.D., Ph.D.

2. Classroom/Lab

To be announced upon contacting　the instructor.

3. Course Purpose and Outline

To learn the advanced skills for the research using genomic approaches, through the understanding of the methodologies and applications in disease genomics.

4. Course Objective(s)

Using the latest genomic approaches, students will propose and validate hypotheses made based on the results of genomic analyses and previous reports. Students also gain an understanding of genomic exploratory research methods through discussions.

5. Format

Lectures, discussions and experiments.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
The purpose of this course is to learn the general flow of disease genomics research, including its application, method, and data mining. One of the main themes is analyzing genomics for cancer tissues, which are composed of not only cancer cells but also stromal cells including fibroblasts, immune cells, etc. Students will learn the application of genomics approach to these complex multi-cellular systems to discover new therapeutic and diagnostic targets and to analyze more details about their mechanisms. In addition, this course includes studies for practical aspects of clinical genomics, like method, infrastructure and guidelines through actual analysis of clinical samples.

Available programs:

Lecture　any time
Special Lecture　any time

Practice

Goals/Outline:
To learn about advanced genomic technologies and methods of molecular biology, to read original scientific articles from related fields, and to perform data interpretations and discussions.

Available programs:

Journal Club　any time

Lab

Goals/Outline:
To be familiar with the basic techniques of molecular biology by learning how to handle DNA/RNA, proteins, culture cells, and lab animals. Also, to be familiar with the evaluations of the whole genomics profiling of complex multi-cellular systems, and understanding practical aspects of clinical genomics.

Available programs:

Participation in a research group any time

7. Grading System

Grading will mainly be based on the content of seminar and research presentations.

8. Prerequisite Reading

Not applicable

9. Reference Materials

Molecular Biology of the Cell 5E, Publisher: Garland Science, ISBN-13: 978-0815341116

10. Important Course Requirements

Not applicable

11. Availability in English

Available

12. Office Hour

Contact : Asistant Professor Takayuki Isagawa tisa.gpat@mri.tmd.ac.jp

13. Note(s) to students

Nothing in particular

Human Genetics and Disease Diversity

Lecture	(code: ７９９１	1st year	:6units)
Practice	(code: ７９９２	1st～2nd year	:4units)
Lab	(code: ７９９３	2nd～3rd year	:8units)

1. Instructor(s)

Professor: Toshihiro Tanaka
Tenure track Junior Associate Professors: Yukinori Okada and Kevin Urayama
Contact person: Toshihiro Tanaka Tel: 03-5803-4660 E-mail: ttana.brc@tmd.ac.jp
Web: http://www.tmd.ac.jp/grad/hgdd/

2. Classroom/Lab

Lectures, practices and laboratory components will mainly be held at the Bioresource Research Center (BRC) in the M&D Tower B1F. For further up to date information, please check the website and bulletin board.

3. Course Purpose and Outline

Humans are diverse organisms, and one area that this diversity is particularly exhibited is in the medical field such as in the way we develop disease and show resistance to treatment and drug side-effects. In order to understand this diversity, examination of inter-individual variation in our genetics and environment is essential by integrating both DNA and mRNA analysis (wet laboratory-based), together with data-mining and the statistical analytic evaluations of these data (dry lab). The purpose of this course is to provide the necessary foundation required to begin applying this integrative approach to individual research.

4. Course Objective(s)

1. Acquire the basic techniques for DNA and mRNA analysis (wet laboratory techinques)
2. Learn the basic procedures for statistical analysis of genetic data (dry laboratory techniques)
3. Understand the relationship between genomic diversity and disease
4. Understand the current state of research of this field and its applications in medical practice

5. Format

・ Course lectures using powerpoint and/or small-group seminar-style lectures
・ Hands-on practicum using clinical samples (e.g. human DNA)
・ In silico statistical analysis of genetic data

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline: Lectures on (i) human genome diversity and disease risks, (ii) research progress in the discovery of human disease associated genes, and (iii) basic methods in the statistical analysis of human genetic data

Available programs:

Course Lecture (biweekly Mondays, 10-11am), Research in Progress (biweekly Mondays, 10-11am), Journal club (every Monday, 9-10am), Bioresource Research Center Seminar (invited lectures from outside the university, periodic)

Practice

Goals/Outline: Practicum in (i) handling of human blood samples and extraction of human DNA / mRNA, (ii) utilizing human genome and epigenome databases, and (iii) statistical analysis of human genetic data obtained from public databases

Available programs:

Course Lecture (biweekly Mondays, 10-11am), Research in Progress (biweekly Mondays, 10-11am), Journal club (every Monday, 9-10am), Bioresource Research Center Seminar (invited lectures from outside the university, periodic)

Lab

Goals/Outline: Work on the (i) extraction of human DNA / mRNA from human blood samples, genotyping of human genome variants, and measuring expression levels of mRNA, (ii) statistical analysis of the generated human genetic data using software packages, (iii) appropriate interpretation of the obtained results, and (iv) "big data" genetic analysis

Available programs:

Journal club (every Monday, 9-10am), Research in Progress (biweekly Mondays, 10-11am), Bioresource Research Center Seminar (invited lectures from outside the university, periodic)

7. Grading System

Evaluation will be made according to participation in the course lectures, discussion, and practicum, and external activities (conferences, papers) with weights placed in the following manner:
・ Participation in the course lectures, discussion, and practicum: 80%
・ External activities: 20%

8. Prerequisite Reading

It is preferable that appropriate pre-requisite reading be performed as necessary to gain a basic familiarity with genomic analysis

9. Reference Materials

Human Molecular Genetics, 4th edition (Publisher: Garland Science)
The Fundamentals of Modern Statistical Genetics (Publisher: Springer)

10. Important Course Requirements

None

11. Availability in English

Available

12. Office Hour

For inquiries regarding course content, it is requested that the student contact the head instructor by email and schedule a meeting time accordingly.

13. Note(s) to students

No special notes

Applied Regenerative Medicine

Lecture	(code:	７００１	1st year	:6units)
Practice	(code:	７００２	1st～2nd year	:4units)
Lab	(code:	７００３	2nd～3rd year	:8units)

1. Instructor(s)

Professor Ichiro Sekiya

2. Classroom/Lab

Venues are different according to the program.

3. Course Purpose and Outline

Our purpose is to support and advance stem cell research and regenerative medicine for the discovery and development of cures, therapies, diagnostics and research technologies to relieve human suffering from chronic disease and injury.

4. Course Objective(s)

Development of regenerative medicine with stem cells.
Realization and industrialization of cell and regenerative therapy.
Establishment of safety test for regenerative medicine.
Translational research.

5. Format

Private instruction for laboratory work and paper writing.
Discussion in research progress and journal club.
Open seminar.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

You can understand advance stem cell research and regenerative medicine through discussions at research progress and journal club.

Available programs:

Monday morning: Presentation by staff.
Tuesday morning: Research progress by stuff and graduate students.
Thursday morning: Research progress by stuff and graduate students.
Friday morning: Journal club.

Practice

Research progress and journal club.

Available programs:

Monday morning: Presentation by staff.
Tuesday morning: Research progress by stuff and graduate students.
Thursday morning: Research progress by stuff and graduate students.
Friday morning: Journal club.

Lab

Development of regenerative medicine with stem cells.
Realization and industrialization of cell and regenerative therapy.
Establishment of safety test for regenerative medicine.
Translational research.

Available programs:

Monday morning: Presentation by staff.
Tuesday morning: Presentation by stuff and graduate students.
Thursday morning: Presentation by stuff and graduate students.
Friday morning: Journal club.

7. Grading System

Grading are performed in a comprehensive way based on the lecture, practice, and laboratory participation situation, reports about research, and conference presentations.

8. Prerequisite Reading

We introduce some papers according to your purposes.

9. Reference Materials

Repetitive allogeneic intraarticular injections of synovial mesenchymal stem cells promote meniscus regeneration in a porcine massive meniscus defect model.
Hatsushika D, Sekiya I et al. Osteoarthritis Cartilage. 2014

Arthroscopic, histological and MRI analyses of cartilage repair after a minimally invasive method of transplantation of allogeneic synovial mesenchymal stromal cells into cartilage defects in pigs.
Nakamura T, Sekiya I et al.
Cytotherapy. 2012

10. Important Course Requirements

A positive behavior is required.

11. Availability in English

Private discussion can be performed in English.

12. Office Hour

Contact person Koji Otabe: otabe.arm@tmd.ac.jp

13. Note(s) to students

For detailed information of what we do, please search our previous papers with PubMed. Key words are “Sekiya I” and “stem cells.”

JFCR Cancer Biology

Lecture	(code:	９０４１	1st year	:6units)
Practice	(code:	９０４２	1st～2nd year	:4units)
Lab	(code:	９０４３	2nd～3rd year	:8units)

1. Instructor(s)

Takuro Nakamura, Kiyotaka Shiba, Kengo Takeuchi, Akihiro Tomida and Toru Hirota

2. Classroom/Lab

The Cancer Institute and Cancer Chemotherapy Center of Japanese Foundation for Cancer Research
3-8-31 Ariake, Koto-ku, Tokyo

3. Course Purpose and Outline

Learning the mechanisms of cancer development and progression, and discussing the novel therapeutics and personalized medicine.

4. Course Objective(s)

Understanding the biological base of cancer and pathology of human cancer. Proposing possible therapeutic strategies based on molecular biology of cancer.

5. Format

Contact with each instructor of interest.

6. Course Description and Timetable

Check with the teacher in charge for the program which is not specifically scheduled.

Lecture

Goals/outline:
Understanding the mechanisms of carcinogenesis and cancer progression. Studying the basics of personalized medicine for innovative cancer therapy.

Available programs:

1. Molecular mechanisms of carcinogenesis and identification of cell-of-origin of cancer (Nakamura)
2. Pathological and genetic analysis of human cancer such as malignant lymphoma and lung cancer (Takeuchi)
3. Application of nanobiotechnology in cancer diagnostics (Shiba)
4. Strategy for innovative drug therapy based on cancer biology (Tomida)
5. Understanding mitotic chromosome dynamics in cancer, to exploit mitotic control to cancer intervention (Hirota)

Practice

Goals/Outline:
Students are expected to present progress reports and to discuss their data with other researchers in the faculty. When sufficient and convincing data are obtained, scientific presentation at the meeting/workshop/symposium will be encouraged.

Available programs:

Progress report (once per week), oral presentation at the annual meeting of Japanese Foundation for Cancer Research (July) and presentation at the scientific meetings (appropriate occasions).

Lab

Goals/Outline:
1. Clarify the carcinogenic mechanisms of leukemia and sarcoma by generating original animal models and analyzing patients' samples (Nakamura).
2. Study the basics of nanobiotechnology and participate in development of cancer diagnostic tools (Shiba).
3. Study the pathological and molecular characteristics of human malignant lymphoma. Search the novel cancer disease genes to utilize them as novel drag targets (Takeuchi).
4. Innovate molecular target therapies based on biological and genetic mechanisms in cancer (Tomida).
5. To elucidate origins of chromosomal instability in malignancies, using current techniques in molecular and cellular biology (Hirota)

Available programs:

Contact with each instructor of interest.

7. Grading System

Will be evaluated based on the attendance record (~70%) and achievement of knowledge and techniques (~30%). Presentation and discussion activities may also be considered as additional information.

8. Prerequisite Reading

Contact with each instructor of interest.

9. Reference Materials

Robert A. Weinberg. The biology of cancer. Second ed. Garland Science.

10. Important Course Requirements

Contact with each instructor of interest.

11. Availability in English

Available

12. Office Hour

Takuro Nakamura, Monday to Friday 9 am to 5 pm, Phone: 03-3570-0462, e-mail: takuro-ind@umin.net

13. Note(s) to students