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# *SYLLABUS*

(English)

NIIGATA UNIVERSITY

Graduate School of Medical and Dental Sciences

Course for Oral Life Science

## Day Course

Period	Time
1 <sup>st</sup> period	8 : 3 0 ~ 1 0 : 0 0
2 <sup>nd</sup> period	1 0 : 1 5 ~ 1 1 : 4 5
3 <sup>rd</sup> period	1 2 : 5 5 ~ 1 4 : 2 5
4 <sup>th</sup> period	1 4 : 4 0 ~ 1 6 : 1 0
5 <sup>th</sup> period	1 6 : 2 5 ~ 1 7 : 5 5
6 <sup>th</sup> period	1 8 : 0 5 ~ 1 9 : 3 5
7 <sup>th</sup> period	1 9 : 4 5 ~ 2 1 : 1 5

# Index

Statement of purpose .....	1
Course Day .....	3
Course Requirements .....	7
Designated Subjects (Required Subjects) .....	9
Designated Subjects (Elective Subjects • Course works for basic dentistry) .....	19
Designated Subjects (Elective Subjects • Course works for clinical dentistry) .....	41
Elective Subjects in a Related Discipline (Elective Subjects) .....	75
Integrated Lectures on Basic and Clinical Dentistry .....	75
Department of Oral Health Science .....	79
Department of Oral Biological Science .....	193
Department of Tissue Regeneration and Reconstruction .....	251
List of faculty members .....	327

## Statement of purpose

The Graduate School program focuses both on education and research in the field of advanced life sciences, incorporating the latest advancements in life science technology and responding to a wide range of medical challenges. The results of comprehensive research are applied to the development of medical treatment for the benefit of society.

The University seeks to train its students with a high sense of integrity and creativity, endeavoring to build a closer connection, not only with the local community, but also in a global society.



These goals implement the philosophy of the Graduate School:

### In Education

1. Training a team of researchers who will expand the field of advanced life sciences
2. Generating medical discoveries that meet the needs of clinical disciplines
3. Equipping professionals to pursue academic activity and healthcare with medical and intellectual integrity
4. Affirming lifelong learning and re-entry into academic life by accepting persons in occupational undertakings, and with cooperation of the University of the Air, whose study center for delivering broadcast lectures, is located on the same campus.

## Course Day

# 2023 Niigata University Graduate School of Medical and Dental Sciences Academic Calendar

 No Classes  
 Schedule Adjustment Days  
 ( ) Exam Days  
 — Days for Make-Up Classes, etc.

## First Semester

## Second Semester

	Sun	Mon	Tue	Wed	Thu	Fri	Sat			Sun	Mon	Tue	Wed	Thu	Fri	Sat	
Apr.							1	4/3 Entrance Ceremony 4/6 Start Classes	Oct.	1	2	3	4	5	6	7	10/2 Autumn Entrance Ceremony 10/3 Start Classes
	2	3	4	5	6	7	8			8	9	10	11	12	13	14	
	9	10	11	12	13	14	15			15	16	17	18	19	20	21	
	16	17	18	19	20	21	22			22	23	24	25	26	27	28	
	23	24	25	26	27	28	29			29	30	31					
	30																
May.		1	2	3	4	5	6		Nov.				1	2	3	4	
	7	8	9	10	11	12	13			5	6	7	8	9	10	11	
	14	15	16	17	18	19	20			12	13	14	15	16	17	18	
	21	22	23	24	25	26	27			19	20	21	22	23	24	25	
	28	29	30	31						26	27	28	29	30			
Jun.					1	2	3	6/1 University Foundation Day	Dec.						1	2	12/27~1/6 Winter Vacation
	4	5	6	7	8	9	10			3	4	5	6	7	8	9	
	11	12	13	14	15	16	17			10	11	12	13	14	15	16	
	18	19	20	21	22	23	24			17	18	19	20	21	22	23	
	25	26	27	28	29	30				24	25	26	27	28	29	30	
										31							
Jul.							1		Jan.		1	2	3	4	5	6	1/9 Start Classes 1/9 Monday Classes
	2	3	4	5	6	7	8			7	8	9	10	11	12	13	
	9	10	11	12	13	14	15			14	15	16	17	18	19	20	
	16	17	18	19	20	21	22			21	22	23	24	25	26	27	
	23	24	(25)	26	(27)	(28)	29			28	29	(30)	(31)				
	30	(31)															
Aug.			1	(2)	3	4	5	8/11~9/30 Summer Vacation	Feb.					1	2	3	
	6	7	8	9	10	11	12			4	(5)	6	7	(8)	(9)	10	
	13	14	15	16	17	18	19			11	12	13	14	15	16	17	
	20	21	22	23	24	25	26			18	19	20	21	22	23	24	
	27	28	29	30	31					25	26	27	28	29			
Sep.						1	2	9/20 Autumn Graduation Ceremony	Mar.						1	2	3/11~3/31 Spring Vacation 3/25 Graduation Ceremony
	3	4	5	6	7	8	9			3	4	5	6	7	8	9	
	10	11	12	13	14	15	16			10	11	12	13	14	15	16	
	17	18	19	20	21	22	23			17	18	19	20	21	22	23	
	24	25	26	27	28	29	30			24	25	26	27	28	29	30	
										31							
Number of Class Weeks		16	16	16	16	16			Number of Class Weeks	16	16	16	16	16	16		

## Four-digits Number: Academic Field and Attained Level

Each subject is given 4-digits number which means Academic field (2 digits) and Attained level(2 digits).

Academic Field:

70 English 90 Basic Dentistry 91 Clinical Dentistry 92 Social Dentistry

Attained Level:

Tens place : 0 Open to all students 1 Open to only to the students of this course

Ones place : 1 Facilitating level 3 Basic level 4 Core level 5 Advanced level

< Chart of Academic Field and Standard >

Category			Four-digits number: Academic Field and Attained Level
Designated Subjects	Required Subjects	Seminar for research and biostatistics Academic Reading & Writing	9211 7013
	Elective Subjects	Course works for basic dentistry Course works for clinical dentistry	9013 9113
Elective Subjects in a Related Discipline	Elective Subjects	Integrated Lectures on Basic and Clinical Dentistry	9015, 9115
		Department Related Subjects	9014
			9114
			9214
			9015
			9115
			9215

\* Please refer to the following URL

<http://www.iess.niigata-u.ac.jp/epc/eso/bunyasuijun.html>

## Grade criteria

A passing grade is score of 60 or more out of 100.

Score	Grade	Standard
100~80	A	Meet high standards of attainment target
79~70	B	Meet standards of attainment target
69~60	C	Meet minimal standards of attainment target
59~0	D	Not meet minimal standards of attainment target

## Notice

- There is possibility of changing in course plan (date and time) depending on the participants' situation.
- Please take the subjects for Basic Course or Clinical Course as follows.
  - ◇ Basic Course (Lecture + Seminar+ Course Work, Total 3 Subjects at least)
  - ◇ Clinical Course (Lecture + Seminar 1 + Seminar 2 (Practice) +Course Work, Total 4 Subjects at least)
- Most subjects offer Type I (for general students) and Type II (for working students), however, the contents are same. The difference is date and time only. You should not take both courses.
- All the elective subjects offer A course (2 Credits) and B course (2 Credits). Even though instructor is same, contents or attainment level are different. You can take both courses.  
  
e.g.: Oral and Maxillofacial Anatomy IA (2 Credits) + Oral and Maxillofacial Anatomy IB (2 Credits)  
Oral and Maxillofacial Anatomy IIA (2 Credits) + Oral and Maxillofacial Anatomy IIB (2 Credits)



# Course Requirements

The Course for Oral Life Science with new concept comprises the following two courses. Course for development of leaders has been established to develop researchers and leaders in the fields of dental and/or medical sciences. Another one, course for advancement in the main discipline focuses on education in the specialized field for general practitioners. Students are expected to take each of the above courses.

**1. Course Requirements (a minimum of 30 credits including lectures, seminars and exercises)**

1) Designated Subjects (Required (6 credits)

The designated subjects are composed of the Seminar for research and biostatistics and English literacy one.

2) Selective Designated Subjects ( a minimum of 4 credits)

Course works for basic dentistry and clinical dentistry are provided to develop fundamental knowledge and skills as graduate students. Students are able to select some of them with a minimum of 4 credits according to each interesting.

3) Subjects in Unrelated Disciplines

Students are able to take subjects in unrelated disciplines comprising lectures, seminars and exercises.

**2. Advisors and Research Program**

Students are supposed to belong to a certain research project, and then to take course works and specific seminars relevant to fundamental matter. After that, an advisory team consisting of one chief advisor and two supervisors is established and a research program is also determined.

**3. Thesis and Evaluation**

The system of “Doctoral Candidate” is applied in the Graduate School. Marks are given to students based upon their educational, research, (clinical) activities and self-learning. Students will have the privilege to submit thesis after obtaining grades determined.

### **Requirements for the PhD Degree**

We can offer the doctoral degree medicine, dentistry, and academics. The PhD degree must be completed within a minimum of four years and following the completion of 30 graduate credit units in the program. Students must complete their doctoral dissertation and pass the final examination. Only students with a successful record of research will be able to complete their degrees within three years.

Designated Subjects  
(Required Subjects)

## Designated Subjects (Required Subjects)

Course	Page
Seminar for research and biostatistics IA, IIA	11
Academic Reading & Writing I A	14
Academic Reading & Writing I B	17

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5601	2	MON/3-4・I A	2	9211	Seminar
230N5602		Video library・IIA			
Course	Seminar for research and biostatistics I A, IIA				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry) Prof. NOHNO Kaname (Div. Oral Science for Health Promotion) Associate Prof. TAKEHARA Sachiko (Div. Preventive Dentistry) Assistant Prof. Kaung Myat Thwin (Div. Preventive Dentistry) Dr. KARAWEKPANYAWONG Raksanan (Mahidol University)				
Place	Intelligence Active Learning Classroom (iALC1)				
I・II					
<p>【Course outline】</p> <p>It is important to learn relevant statistical methods for the content of protocol (study design) to succeed in researches. This course is designed to provide theory in research preparation and statistical analysis as based on case study.</p> <p>【Course aim】</p> <p>This course aims to provide basic statistical knowledge to cover several thematic units in research (aim/study design, method/ eligible criteria, sample allotment, endpoint and evaluation, statistical analysis).</p> <p>【Attainment target】</p> <p>This course helps to give the students confidence in planning, practice and analysis in research.</p> <p>【Study method・attention】</p> <p>Each of content will include a lecture component as based on scientific published papers and a group discussion component. Lecture materials will be suggested accordingly. Live special lecture will be delivered via Zoom online. Video library will be released at the day after each lecture. Further instructions will be guided during the course enrollment.</p>					
【Plan】					
No.	Date	Contents	Preparing learning	Instructor	
1	October 16 3 period	Introduction - Validity of study design-	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
2	October 23 3 period	Study design and protocol I	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
3	October 23 4 period	Framing of study protocol, research questions (Group work)	Materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin	
4	October	Study design and protocol II	Lecture materials	OGAWA Hiroshi	

	30 3 period		will be suggested accordingly	
5	October 30 4 period	Constructing study protocol I (Group work)	Materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin
6	November 6 3 period	Structured abstracts and basic presentation	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	November 6 4 period	Constructing study protocol II (Group work)	Materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin
8	November 13 3 period	Basic statistics I (Standard Deviation, Standard Error, Normal distribution, Confidence interval, Hypothesis testing, P value)	Lecture materials will be suggested accordingly	NOHNO Kaname
9	November 13 4 period	Exercise of statistics	Materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin
10	November 20 3 period	Basic statistics II (Univariate analysis, Multiple test, Multivariate analysis, Sample size and power )	Lecture materials will be suggested accordingly	NOHNO Kaname
11	November 20 4 period	Exercise of statistics	Materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin
12	November 27 3 period	Case studies and critical thinking	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
13	November 27 4 period	Publication search/making evidence table and systematic review	Lecture materials will be suggested accordingly	TAKEHARA Sachiko Kaung Myat Thwin
14	December 4 3 period	Research ethics for scientific study Presentation and evaluation of study protocol	Lecture materials will be suggested accordingly	OGAWA Hiroshi
15	December 11 3 period	Special lecture (via-Zoom online) Preparation for acting as PI	Lecture materials will be suggested accordingly	KARAWKPNYAWONG Raksanan
16, 17	December 18 3, 4 period	Presentation and evaluation of study protocol	Preparation for presentation	OGAWA Hiroshi TAKEHARA Sachiko Kaung Myat Thwin

**【Evaluation】**

Evaluated by assignments and presentations (80%) and debates (20%). Absence will not be allowed.  
Students who watch video library will be required to submit all assignments to get the final score.

**【Media】**

Textbooks will be indicated if required.

**【Reference book】**

References will be indicated if required.



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5603	1	Fri/1, 2・IA	2	7013	Real-time online lessons using Zoom
Course	Academic Reading & Writing IA				
Instructor	Prof. John E. Plagens (Japan Lutheran College)				
Place	Zoom				
Reading	<p>【Course outline】</p> <p>Students will be introduced to the reading skills in the textbook. These will include scanning, skimming, context clues, and inferences.</p> <p>【Course aim】</p> <p>Students find information from reading passages and become familiar with the rhetoric of English writing.</p> <p>【Attainment target】</p> <p>Students can understand the rhetoric of English writing and identify topics and supporting ideas.</p> <p>Students can work with authentic material.</p> <p>【Study method・attention】</p> <p>Skills will be introduced in class, to be reviewed by students in homework assignments. The limited class time requires students to be present each session. There will be a take-home test with a study sheet at the end of the first half.</p>				
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	April 7	Introduction, vocabulary study, Part 2, Unit 1.		Details will be given in class.	John Plagens
2	April 14	Scanning, Part 3, Unit 1.		Details will be given in class.	John Plagens
3	April 21	Skimming, Part 3, Unit 6.		Details will be given in class.	John Plagens
4	April 28	Meaning from Context, Part 2, Unit 3.		Details will be given in class.	John Plagens
5	May 12	Making Inferences, Part 3, Unit 2.		Details will be given in class.	John Plagens
6	May 19	Topics of Paragraphs		Text pp. 147-155.	John Plagens
7	May 26	Main Ideas of Paragraphs		Text pp. 156-	John Plagens
8	June 2	Free study period		Details will be given in class.	John Plagens

<p><b>【Evaluation】</b> Attendance, homework assignments, and a take-home test. The homework will comprise 70% of the grade; late homework will receive <math>\frac{1}{2}</math>. The take-home test will be 30% of the final grade.</p> <p><b>【Media】</b> More Reading Power (3rd Edition, Longman) by Beatrice S. Mikulecky and Linda Jeffries. (approx. ¥4000)</p>				
<p><b>Writing</b></p> <p><b>【Course outline】</b> A comprehensive review of writing skills from the sentence level to paragraph and essay construction.</p> <p><b>【Course aim】</b> Students acquire the writing skills necessary for composing a well written essay.</p> <p><b>【Attainment target】</b> Students can understand the components of the English essay: introduction styles, thesis statements, supporting paragraphs, and concluding paragraphs. Also included will be outlining and self-editing. Each student can make an essay at the end of the first half of the course.</p> <p><b>【Study method・attention】</b> Attendance in class is required as there will be in-class writing practice. There will also be homework assignments each time. These will be submitted to the instructor by e-mail.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	April 7	Introduction to sentence types, common errors in English writing.	Text, pp. 170-181	John Plagens
2	April 14	More on sentence types, introduction to the paragraph.	Text, pp. 182-187; pp. 2-9	John Plagens
3	April 21	Further studies on the paragraph.	Text, pp. 11-21	John Plagens
4	April 28	Unity and coherence in the paragraph.	Text, pp. 22-30	John Plagens
5	May 12	Introduction to logical connectors.	Text, pp. 31-39; Logical Order, pp. 40-41	John Plagens
6	May 19	Introduction to the essay.	Text, pp. 73-85	John Plagens
7	May 26	Outlining, essay unity.	Text, pp. 86-100	John Plagens
8	June 2	Free study period	Details will be given in class.	John Plagens
<p><b>【Evaluation】</b> The essay and take-home tests will comprise 30% of the final grade. The homework is 70%.</p> <p><b>【Media】</b> Writing Academic English (Fifth Edition), by Alice Oshima and Ann Hogue, Longman (approx. ¥4000)</p>				

**【Reference book】**

トップジャーナルに学ぶ センスのいい科学英語論文の書き方、ブレゲンズ ジャン E、医学書院（¥3740 円）

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5604	1	Fri/1, 2・IB	2	7013	Real-time online lessons using Zoom
Course	Academic Reading & Writing IB				
Instructor	Prof. John E. Plagens (Japan Lutheran College)				
Place	Zoom				
Reading	<p><b>【Course outline】</b></p> <p>Students will build on the reading skills acquired in the first half and continue using the textbook.</p> <p><b>【Course aim】</b></p> <p>Students understand common patterns of organization in reading as well as the logical connectors employed. Participants will be able to choose reading topics.</p> <p><b>【Attainment target】</b></p> <p>Students can acquire the ability to analyze authentic material for patterns of organization. Students can gain an understanding of the organization of academic papers.</p> <p><b>【Study method・attention】</b></p> <p>Attendance at each session is absolutely necessary. There will be homework assignments each time. A final take-home test will be given.</p>				
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	June 9	Sentence patterns, Listing pattern, additive connectors.	Text, pp. 172-175		John Plagens
2	June 16	Sequence pattern, sequential connectors.	Text, pp. 175-178		John Plagens
3	June 23	Comparison/Contrast pattern, adversative connectors.	Text, pp. 179-181		John Plagens
4	June 30	Cause/Effect pattern, causal connectors.	Text, pp. 181-184		John Plagens
5	July 7	Problem/Solution pattern, pattern review.	Text, pp. 184-186; pp, 187-188		John Plagens
6	July 14	Summarizing, Reading Longer Passages	pp. 194-		John Plagens
7	July 21	More on Summarizing	Details will be given in class.		John Plagens
8	July 28	Free study period	Details will be given in class.		John Plagens
<p><b>【Evaluation】</b></p> <p>Attendance attitude, homework assignments, and final take-home test.</p>					

<p>The homework will comprise 70% of the grade; late homework will receive <math>\frac{1}{2}</math>. The final take-home test will be 30% of the final grade.</p> <p><b>【Media】</b> More Reading Power (3rd Edition, Longman) by Beatrice S. Mikulecky and Linda Jeffries. (approx. ¥4000)</p>				
<p><b>Writing</b></p> <p><b>【Course outline】</b> Students will continue learning writing skills necessary for professional papers. The course will cover such topics as patterns of organization and the composition of abstracts and professional papers.</p> <p><b>【Course aim】</b> Students acquire the rhetoric and writing skills necessary for professional papers.</p> <p><b>【Attainment target】</b> Students can understand patterns of writing organization and rhetorical devices used in professional papers and reports. Authentic examples will be used for reference.</p> <p><b>【Study method・attention】</b> Attendance in class is required as there will be in-class writing practice. There will also be homework for each class; these assignments will be submitted by e-mail before the next class.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	June 9	Interpreting and explaining graphs: Narration, Description, Exposition	Details will be given in class.	John Plagens
2	June 16	Ch. 5: Chronological Order: Process Essays	Chapter 5	John Plagens
3	June 23	Ch. 7: Comparison/Contrast Essays	Chapter 7	John Plagens
4	June 30	Ch. 6: Cause/Effect Essays	Chapter 6	John Plagens
5	July 7	Writing abstracts, summaries, and introductions: Ch. 3 Summarizing, the “Moves”	Chapter 3	John Plagens
6	July 14	Rhetorical organization of research papers; Analyzing Discussions	Details will be given in class.	John Plagens
7	July 21	Definitions in research: topics and terminology	Details will be given in class.	John Plagens
8	July 28	Free study period	Details will be given in class.	John Plagens
<p><b>【Evaluation】</b> The essay and take-home tests will comprise 30% of the final grade. The homework is 70%.</p> <p><b>【Media】</b> Writing Academic English (Fifth Edition), by Alice Oshima and Ann Hogue, Longman (approx. ¥4000)</p> <p><b>【Reference book】</b> トップジャーナルに学ぶ センスのいい科学英語論文の書き方、プレゲンズ ジャン E、医学書院 (¥3740 円)</p>				

Designated Subjects  
(Elective Subjects •  
Course works for basic dentistry)

## Designated Subjects (Elective Subjects・Course works for basic dentistry)

Course	Page
Tissue Engineering Coursework I, II	21
Coursework for Biomaterials I, II	23
Basic course for morphological analysis I, II	25
Basic course for orofacial function I, II	27
Basic Course for Maxillofacial Anatomy I, II	29
Basic Cell Biology I, II	32
Basic oral pathology course I, II	34
Ethics, Laws, and Regulations in Medical and Dental Sciences I, II	36
International collaboration in the field of basic research	38

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5611	1	Thu, 6, 7・ I	4	9013	Lecture and Practice
230N5612		Fri, 6, 7・ II			
Course	Tissue Engineering Coursework I, II				
Instructor	Prof. Kenji IZUMI (Div. Biomimetics)				
Place	A204 Alliance etc.				
I・II					
<b>【Course outline】</b> Cell culture technique is necessary to conduct biological and medical researches because the cell culture environment can be accurately controlled, and the observation of cells in vitro and handling cells can be simply done, compared with an animal study. Students in this wet laboratory course are instructed the minimum skills and knowledges that require for cell culture and will be able to obtain basic cell culture techniques.					
<b>【Course aim】</b> In this course, students will acquire the technique of primary cell culture obtained from human oral mucosa keratinocytes and fibroblasts. Furthermore, students will learn another techniques such as cell passage (subculture), cryopreservation and three-dimensional cell culture for organogenesis.					
<b>【Attainment target】</b> After this course, the students should be able to • explain the advantages and disadvantages of cell culture. • correctly handle cell culture vessels using aseptic techniques. • dispense cell culture media as well as reagents. • establish primary oral keratinocytes and fibroblasts culture. • feed and passage cells. • cryopreserve cells and develop an organotypic culture.					
<b>【Study method・attention】</b> • Prepare lab notes by your own. Hair ties Keep valuable jewelry at home Wear closed toe shoes No long flowing sleeves • Course materials are provided prior to the class.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/6 4/7	Introduction What is cell culture?	The details are instructed in the class.	Kenji Izumi	
2	4/13 4/14	Cell culture equipment Cell culture supplies	The details are instructed in the class.	Kenji Izumi	



3	4/20 4/21	Aseptic techniques Dispense culture media and reagents	The details are instructed in the class.	Kenji Izumi
4-6	4/27 5/11 5/18 4/28 5/12 5/19	Establishment of primary oral keratinocytes culture	The details are instructed in the class.	Kenji Izumi
7-9	5/25 6/1 6/8 5/26 6/2 6/9	Change culture medium and passage cells	The details are instructed in the class.	Kenji Izumi
10	6/15 6/16	Cryopreservation of cells	The details are instructed in the class.	Kenji Izumi
11	6/22 6/23	Establishment of primary fibroblasts culture	The details are instructed in the class.	Kenji Izumi
12-14	6/29 7/6 7/13 6/30 7/7 7/14	3D cell culture methods	The details are instructed in the class.	Kenji Izumi
15	7/20 7/21	Summary	Reviewing all previous courseworks.	Kenji Izumi
16	7/27 7/28	Examination	Reviewing all previous courseworks.	Kenji Izumi

**【Evaluation】**

The grade is evaluated by face-to-face oral and written examination regarding living cells cultured by each student (50% each)

**【Media】**

Original Cell Culture Manual is provided.

**【Reference book】**

I provide research papers if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5613	1	Tue/1, 2・I	4	9013	Lecture・Practice
230N5614		Wed/6, 7・II			
Course	Coursework for Biomaterials I, II				
Instructor	Lecturer Mitsugu KANATANI (Div. Biomimetics)				
Place	Seminar room C412 etc.				
I・II					
<p>【Course outline】</p> <p>This course instructs the characteristics of ceramic materials, medical polymer materials, metallic materials and their composite materials. Biocompatibility, in vivo reactions of biomaterials and evaluation criteria of biomaterials are also discussed.</p> <p>【Course aim】</p> <p>In this coursework, students are required to understand characteristics biomaterials and their in vivo reactions and to consider methods for evaluation of biomaterials.</p> <p>【Attainment target】</p> <p>After this coursework, the students should be able to</p> <ul style="list-style-type: none"><li>• explain relationship between biomaterials and biological body.</li><li>• explain characterization of biomaterials.</li><li>• choose an appropriate biomaterial for a given implant design and use based on biomechanics.</li><li>• discuss characteristics of new biomaterials such as nano particles and their in vivo reactions.</li><li>• explain reasons for applying composite materials for biomaterials.</li><li>• discuss evaluation criteria of biomaterials.</li></ul> <p>【Study method・attention】</p> <ul style="list-style-type: none"><li>• Prepare lab notes by your own.</li></ul> <p>Hair ties</p> <p>Keep valuable jewelry at home</p> <p>Wear closed toe shoes</p> <p>No long flowing sleeves</p> <ul style="list-style-type: none"><li>• Course materials are provided prior to the class.</li><li>• This course is composed of lectures and discussion.</li></ul>					
【Plan】					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/11 4/12	Types and updates of biomaterials	The details are instructed in the class.	Mitsugu Kanatani	
2	4/18 4/19	Biological body and biomaterials	The details are instructed in the class.	Mitsugu Kanatani	
3, 4	4/25	Biomechanics 1, 2	The details are	Mitsugu	

	5/ 2 4/26 5/10		instructed in the class.	Kanatani
5-7	5/ 9 5/16 5/23 5/17 5/24 5/31	Ceramics as biomaterials 1-3	The details are instructed in the class.	Mitsugu Kanatani
8-10	5/30 6/ 6 6/13 6/ 7 6/14 6/21	Polymer materials as biomedical 1-3	The details are instructed in the class.	Mitsugu Kanatani
11, 12	6/20 6/27 6/28 7/ 5	Metal materials as biomaterials 1, 2	The details are instructed in the class.	Mitsugu Kanatani
13	7/ 4 7/12	Composite materials as biomaterials	The details are instructed in the class.	Mitsugu Kanatani
14	7/11 7/19	Evaluation criteria for biomaterials	The details are instructed in the class.	Mitsugu Kanatani
15	7/18 7/26	Summary	Reviewing all previous courseworks.	Mitsugu Kanatani
16	7/25 8/ 2	Examination	Reviewing all previous courseworks.	Mitsugu Kanatani

**【Evaluation】**

The grade is evaluated by oral and written examination regarding living cells cultured by each student (50% each).

**【Media】**

We provide scientific papers if required.

**【Reference book】**

We provide research papers if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5615	1	Fri／1, 2・I	4	9013	Lecture・Practice
230N5616		Fri／6, 7・II			
Course	Basic course for morphological analysis I, II				
Instructor	Prof. Atsushi Ohazama (Div. Oral Anatomy) Assoc. Prof. Maiko Kawasaki (Div. Oral Anatomy) Assist. Prof. Katsushige Kawasaki (Ctr. Advanced Oral Science)				
Place	Oran Anatomy Lab				
I・II					
<b>【Course outline】</b> Histological research requires for skills which involve tissue preparation, a variety of staining, observations with a light microscope as well as taking microphotographs. This course work aims to obtain knowledge and skills for several morphological techniques.					
<b>【Course aim】</b> In this course, the students acquire preparing paraffin sections and performing hematoxylin-eosin and AZAN staining. Furthermore, they acquire basic immunohistochemical and in situ hybridization procedures.					
<b>【Attainment target】</b> Students can fix animal tissues under suitable anesthesia. Students can prepare tissue section including paraffin, frozen and cryostat sections. Students can stain histological specimens. Students can perform basic immunohistochemistry. Students can perform basic <i>in situ</i> hybridization. Students can examine histologic sections using a digital light microscope.					
<b>【Study method・attention】</b> The instruction will be done by the procedure indicated by our original text. Text will be provided in advance.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	April 7	Guidance	Details will be given in class.		Atsushi Ohazama
2	April 14	Holding animals and anesthesia	Details will be given in class.		Atsushi Ohazama
3	April 21	Summary of histological preparation	Details will be given in class.		Atsushi Ohazama
4	April 28	Fixation of animal and tissue	Details will be given in class.		Atsushi Ohazama
5	May 12	Extracting tissue	Details will be given in class.		Atsushi Ohazama

6	May 19	Preparation of paraffin sections	Details will be given in class.	Katsushige Kawasaki
7	May 26	Preparation of frozen sections	Details will be given in class.	Maiko Kawasaki
8	June 2	Hematoxylin-eosin staining	Details will be given in class.	Atsushi Ohazama
9	June 9	AZAN staining	Details will be given in class.	Atsushi Ohazama
10	June 16	Immunohistochemistry (fluorescence)	Details will be given in class.	Maiko Kawasaki
11	June 23	Immunohistochemistry (DAB development)	Details will be given in class.	Atsushi Ohazama
12	June 30	<i>In situ</i> hybridization (DIG probe) 1	Details will be given in class.	Atsushi Ohazama
13	July 7	<i>In situ</i> hybridization (DIG probe) 2	Details will be given in class.	Maiko Kawasaki
14	July 14	Observations and taking digital photos	Details will be given in class.	Katsushige Kawasaki
15	July 21	Discussion	Details will be given in class.	Katsushige Kawasaki
16	July 28	Summary and Examination	Details will be given in class.	Atsushi Ohazama, Maiko Kawasaki, Katsushige Kawasaki
<p><b>【Evaluation】</b> Oral examination (100%)</p> <p><b>【Media】</b> A Manual of Histologic Preparation edited by Div. Oral Anatomy</p> <p><b>【Reference book】</b> We provide research papers if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5617	1	Thu/3, 4・I	4	9013	Lecture
230N5618		Thu/6, 7・II			
Course	Basic course for orofacial function I, II				
Instructor	Prof. Kensuke Yamamura (Div. Oral Physiology) Associate Prof. Keiichiro Okamoto (Div. Oral Physiology)				
Place	Laboratory of Oral Physiology				
I・II					
<b>【Course outline】</b> This lecture is designed to provide PhD students with an understanding of orofacial function from a physiological perspective. Specific topics are orofacial pain, mastication and swallowing. Students shall improve understanding of orofacial functions by reading recent research papers by correlating basic knowledge acquired during undergraduate years.					
<b>【Course aim】</b> The aims of this course are to acquire the physiological knowledge of orofacial functions required for basic or clinical research in dentistry.					
<b>【Attainment target】</b> <ul style="list-style-type: none"><li>● Explain structures and functions of the trigeminal, facial and hypoglossal nervous system.</li><li>● Explain function and neural basis of orofacial somatosensory systems.</li><li>● Explain the neural mechanisms of orofacial pain.</li><li>● Explain control mechanisms of orofacial voluntary movements.</li><li>● Explain neural control mechanisms of masticatory movements.</li><li>● Explain neural control mechanisms of swallowing.</li></ul>					
<b>【Study method・attention】</b> Seminar and/or discussion style is employed. Students require sufficient preparations prior to each lecture. Although the face to face seminar is held; however, the on-line lecture/seminar (real time) with the Zoom could be possible when necessary.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/6	Guidance	N. A.		Yamamura, Okamoto
2	4/13	Structure and function of the trigeminal nervous system	Organizing the main points of the materials distributed at the class		Yamamura
3, 4	4/20 4/27	Orofacial sensory systems (Overview)	Organizing the main points of the materials distributed at the class		Okamoto

5	5/11	Orofacial pain	Read the research article introduced at the class	Okamoto
6, 7	5/18 5/25	Pathophysiology of orofacial pain	Read the research article introduced at the class	Okamoto
8, 9	6/1 6/8	Orofacial motor systems (Overview)	Organizing the main points of the materials distributed at the class	Yamamura
10	6/15	Facial and tongue movements	Organizing the main points of the materials distributed at the class	Yamamura
11, 12	6/22 6/29	Mastication	Read the research article introduced at the class	Yamamura
13, 14	7/6 7/13	Swallowing	Read the research article introduced at the class	Yamamura
15	7/20	Conclusion and discussion	Review of previous classes	Yamamura, Okamoto
16	8/3	Examination	Review of previous classes	Yamamura, Okamoto

**【Evaluation】**

Report and Examination (50%), Observation record during seminar (50%). The oral examination is conducted by face to face with the instructor.

**【Media】**

N. A.

**【Reference book】**

A journal article will be provided when needed.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5619	1	Wed/ 5 ・ 6 ・ I	4	9013	practice
230N5620		Thu/ 6 ・ 7 ・ II			
Course	Basic Course for Maxillofacial Anatomy I, II				
Instructor	Prof. Hayato Ohshima (Div. Anatomy and Cell Biology of the Hard Tissue), ext. 2812, e-mail: histoman@dent.niigata-u.ac.jp Associate Prof. Hiroko Ida (Div. Anatomy and Cell Biology of the Hard Tissue), ext. 2813, e-mail: hyone@dent.niigata-u.ac.jp				
Place	Laboratory for Dissection				
IA ・ IIA					
<b>【Course outline】</b> It is necessary to integrate the anatomical knowledge learned at the undergraduate course for the clinical and investigative approaches in the field of maxillofacial anatomy. Especially, the understanding of maxillofacial anatomy from the clinical point of view is required for clinicians and researchers. This course provides the dissection program for head and neck regions for graduate students and focuses on the dissection practice using a cadaver.					
<b>【Course aim】</b> The students shall learn the morphological features of maxillofacial regions in the human body and the spatial arrangement and relationship among their components such as organs, nerves, blood vessels, and so on.					
<b>【Attainment target】</b> <ul style="list-style-type: none"><li>• The students can dissect sprahyoid, masseter, and temporal muscles and their associated nerves and blood vessels, and explain their origin, insertion, innervation, vascular supply, and function.</li><li>• The students can open mandibular canals and explain their course.</li><li>• The students can dissect temporomandibular joints and their associated muscles, ligaments, nerves and blood vessels, and explain their structure and function.</li><li>• The students can dissect submandibular, sublingual, and parotid glands and their associated ducts, nerves and blood vessels, and explain their structure, function and innervation.</li><li>• The students can dissect trigeminal, facial, glossopharyngeal, vagus, accessory and sublingual nerves, and explain their components such as motor, sensory and ganglion.</li><li>• The students can dissect nasal cavity, tongue and palate, and explain their structure, function, innervation, blood supply and paranasal sinus.</li><li>• The students can open pterygopalatine fossa, and explain the associated nerves and blood vessels.</li></ul>					
<b>【Study method・attention】</b> The students have to study the manual for dissection beforehand and to study continuously during the practice for the improvement of the skill for dissection.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1-2	4/12 class 5/6 or 4/6	Prone position: surface observation, decortication and cutaneous nerves	Manual p.9-15		Hayato Ohshima



	class 6/7			Hiroko Ida
3-4	4/19 class 5/6 or 4/13 class 6/7	Prone position: sternocleidomastoid muscle, and levator scapulae muscle	Manual p.16-21	Hayato Ohshima Hiroko Ida
5-6	4/26 class 5/6 or 4/20 class 6/7	Supine position: surface observation, decortications, and cutaneous nerves	Manual p.22-26	Hayato Ohshima Hiroko Ida
7-8	5/10 class 5/6 or 4/27 class 6/7	Supine position: platysma, digastric, mylohyoid, and neck muscles	Manual p.27-47	Hayato Ohshima Hiroko Ida
9-10	5/17 class 5/6 or 5/11 class 6/7	Supine position: decortications, thyroid gland, and subclavian artery and vein	Manual p.48-68	Hayato Ohshima Hiroko Ida
11-12	5/24 class 5/6 or 5/18 class 6/7	Prone position: head mutilation	Manual p.69-76	Hayato Ohshima Hiroko Ida
13-14	5/31 class 5/6 or 5/25 class 6/7	No position: pharynx, masseter muscle, and temporal muscle	Manual p.77-88	Hayato Ohshima Hiroko Ida
15-16	6/7 class 5/6 or 6/1 class 6/7	No position: mandibular canal, medial and lateral pterygoid muscle, temporomandibular joint, and submandibular gland	Manual p.89-91	Hayato Ohshima Hiroko Ida
17-18	6/14 class 5/6 or 6/8 class 6/7	No position: mandibular canal, medial and lateral pterygoid muscle, temporomandibular joint, and submandibular gland	Manual p.89-91	Hayato Ohshima Hiroko Ida
19-20	6/21 class 5/6 or 6/15 class 6/7	No position: mandibular nerve	Manual p.89-91	Hayato Ohshima Hiroko Ida
21-22	6/28 class 5/6 or 6/22 class 6/7	No position: orbit, eyeball, inner ear, and nasal cavity	Manual p.94-100	Hayato Ohshima Hiroko Ida
23-24	7/5 class 5/6 or 6/29 class 6/7	No position: pharynx, tongue, and palatine	Manual p.101-103	Hayato Ohshima Hiroko Ida
25-26	7/12 class 5/6 or 7/6 class 6/7	No position: pterygopalatine fossa	Manual p.104-107	Hayato Ohshima Hiroko Ida
27-28	7/19 class 5/6 or 7/13 class 6/7	No position: cranial nerves	Manual p.104-107	Hayato Ohshima Hiroko Ida

29-30	7/26 class 5/6 or 7/20 class 6/7	Summary and Examination		Hayato Ohshima Hiroko Ida
<p><b>【Evaluation】</b></p> <p>Comprehensive evaluation to assess whether the students have achieved attainment targets or not is performed by both oral test (30%) and report (70%) including attitude at the practice.</p> <p><b>【Media】</b></p> <p>The manual for dissection will be distributed beforehand.</p> <p><b>【Reference book】</b></p> <ul style="list-style-type: none"> <li>・ 口腔解剖学 1 骨学：上條雍彦著（アナトーム社）定価 9,800 円</li> <li>・ 口腔解剖学 2 筋学：上條雍彦著（アナトーム社）定価 9,000 円</li> <li>・ 口腔解剖学 3 脈管学：上條雍彦著（アナトーム社）定価 9,600 円</li> <li>・ 口腔解剖学 4 神経学：上條雍彦著（アナトーム社）定価 9,900 円</li> <li>・ 口腔解剖学 5 内臓学：上條雍彦著（アナトーム社）定価 9,700 円</li> <li>・ 科学的根拠から学ぶインプラント外科学 ベーシック編：古賀剛人（クインテッセンス）定価 7,350 円</li> <li>・ 科学的根拠から学ぶインプラント外科学 応用編：古賀剛人（クインテッセンス）定価 14175 円</li> <li>・ 科学的根拠から学ぶインプラント外科学 偶発症編：古賀剛人（クインテッセンス）定価 11,550 円</li> <li>・ 実習人体解剖図譜：浦 良治著（南江堂）定価 5,403 円</li> <li>・ 分担解剖学 1（総説・骨学・靱帯学・筋学）第 11 版：森 於菟 / 小川 鼎三 / 大内 弘 / 森 富 著（金原出版）定価 9,765 円</li> <li>・ 分担解剖学 2（脈管学・神経系）第 11 版：原著）平沢 興 原著、岡本 道雄 改訂（金原出版）定価 11,130 円</li> <li>・ 分担解剖学 3（感覚器学・内臓学）第 11 版：小川 鼎三 原著、山田 英智 改訂、養老 孟司 著改訂（金原出版）定価 9,030 円</li> <li>・ 日本人体解剖学（第 19 版）（全 2 冊）：金子丑之助原著（南山堂）上巻：定価 12,600 円、下巻：定価 10,500 円</li> <li>・ 人体解剖学（第 42 版）：藤田恒太郎著（南江堂）定価 9,975 円</li> <li>・ 解剖学アトラス：越智淳三訳（文光堂）定価 10,500 円</li> <li>・ カラー人体解剖学 構造と機能：ミクロからマクロまで：FH マティーニ、MJ ティモンズ、MP マッキンリ著（西村書店）定価 7,800 円</li> <li>・ グレイ解剖学原著第 2 版：塩田浩平、瀬口春道、大谷浩、杉本哲夫訳（エルゼビア・ジャパン）定価 10,500 円（税込）</li> <li>・ グレイ解剖学アドレス原著第 1 版：塩田浩平訳（エルゼビア・ジャパン）定価 9,450 円</li> <li>・ Susan Standing: Gray' s Anatomy 40th edition, Elsevier, 2008, 25,473 yen.</li> <li>・ あたらしい人体解剖学アトラス：佐藤達夫訳（メディカル・サイエンス・インターナショナル）定価 7,350 円</li> <li>・ プロメテウス解剖学アトラス頭部／神経解剖学：坂井建雄、河田光博監訳（医学書院）定価 11,550 円</li> <li>・ プロメテウス解剖学アトラス頸部／胸部／腹部・骨盤部：坂井建雄、大谷 修監訳（医学書院）定価 11,550 円</li> <li>・ プロメテウス解剖学アトラス解剖学総論／運動器系：坂井建雄、松村穰児監訳（医学書院）定価 12,600 円</li> <li>・ プロメテウス解剖学アトラス口腔・頭頸部第 2 版：坂井建雄、天野 修監訳（医学書院）定価 16,000 円</li> <li>・ トートラ解剖学：小澤一史、千田隆夫、高田邦昭、依藤 宏監訳（丸善）定価 10,000 円</li> <li>・ 解剖学カラーアトラス第 7 版：J. W. Rohen、横地千仩、E. Lutjen-Drecoll 共著（医学書院）定価 12,000 円</li> <li>・ ネットー頭頸部・口腔顎顔面の臨床解剖学アトラス第 3 版：Neil S. Norton 著、前田健康監訳（医歯薬出版）定価 11,000 円</li> </ul>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5621	1	Mon/5-7・I	4	9013	lecture and practical
230N5622		Mon/5-7・II			
Course	Basic Cell Biology I, II				
Instructor	Prof. Miho Terunuma				
Place	Laboratory of Oral Biochemistry				
I・II					
<b>【Course outline】</b> This course introduces the basic and advanced lab techniques in Cell Biology. It consists of lectures and practical laboratories. Up-to-date information will be obtained by discussing newly published research articles.					
<b>【Course aim】</b> This laboratory-based course provides basic cell biology knowledge and techniques to young researchers.					
<b>【Attainment target】</b> On successfully completing this course, students should be able to: (1) perform cell culture in mammalian cells (2) purify plasmids (3) perform transient transfection in mammalian cells (4) detect proteins using immunofluorescence and immunoblotting analysis					
<b>【Study method・attention】</b> This course is based on lectures and practical laboratories.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review	Instructor	
1	April 10	Orientation, Basic lecture of cell biology	The details are instructed in the class.	Terunuma M	
2	April 17	Preparation of LB medium, transformation	The details are instructed in the class.	Terunuma M	
3	April 24	Plasmid preparation	The details are instructed in the class.	Terunuma M	
4	May 1	Agarose gel electrophoresis	The details are instructed in the class.	Terunuma M	
5	May 8	Mammalian cell cultures (reagents, subculture, cell counting)	The details are instructed in the class.	Terunuma M	
6	May 15	Transfection protocols 1	The details are instructed in the	Terunuma M	

			class.	
7	May 22	Transfection protocols 2	The details are instructed in the class.	Terunuma M
8	May 29	Preparation of cell lysate	The details are instructed in the class.	Terunuma M
9	June 5	Protein assay	The details are instructed in the class.	Terunuma M
10	June 12	SDS-PAGE, Western blot 1	The details are instructed in the class.	Terunuma M
11	June 19	SDS-PAGE, Western blot 2	The details are instructed in the class.	Terunuma M
12	June 26	Gel staining after SDS-PAGE	The details are instructed in the class.	Terunuma M
13	July 3	Immunocytochemistry 1	The details are instructed in the class.	Terunuma M
14	July 10	Immunocytochemistry 2	The details are instructed in the class.	Terunuma M
15	July 24	Immunocytochemistry 3	The details are instructed in the class.	Terunuma M
16	July 31	Summary of program, oral presentation, examination	The details are instructed in the class.	Terunuma M

**【Evaluation】**

Oral presentation (60%) and oral examination (40%)

**【Media】**

Lab manual will be provided at the beginning of the course.

**【Reference book】**

We provide scientific research articles if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5623	1	Thursday/6-7・I	4	9013	Lecture (face-to-face class)
230N5624		Thursday/6-7・II			
Course	Basic oral pathology course I, II				
Instructor	Prof. Jun-ichi Tanuma, Assistant Prof. Manabu Yamazaki, Assistant Prof. Tatsuya Abé				
Place	Laboratory room of Division of Oral Pathology				
I・II					
<b>【Course outline】</b> Seminar on Basic oral pathology course is that it deals with the methodology for research on pathogenesis of oral and maxillofacial diseases from the aspect of molecular pathology. Modern trends in molecular biology technology which should be applied in pathological research on oral and maxillofacial diseases will be lectured.					
<b>【Course aim】</b> Student will understand the pathogenesis of oral and maxillofacial diseases, including their causative factors, molecular mechanism, clinical processes, and prognoses. Clinic-pathological aspects of their diagnostic criteria will be emphasized towards the end of their prevention and treatments.					
<b>【Attainment target】</b> Student will understand this course as follows; ・Understanding various clinical characteristics of oral and maxillofacial diseases. ・Distinguishing clinicopathological features for oral and maxillofacial diseases. ・Understanding possible pathogenetic processes of oral and maxillofacial diseases. ・Understanding clinical and pathological diagnostic issues on of oral and maxillofacial diseases. ・Understanding possible prevention strategies against of oral and maxillofacial diseases.					
<b>【Study method・attention】</b> Basic on this seminar will be conducted by lectures and discussions. To prepare for this seminar, students need to read reference textbooks and papers.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	04/06	Guidance & Diseases of tooth and periodontal tissue 1	The details will be given in class		Jun-ichi Tanuma
2	04/13	Diseases of tooth and periodontal tissue 2	Textbook 1 pp67-97		Jun-ichi Tanuma
3	04/20	Diseases of oral mucosa 1	Textbook 1 pp239-256		Jun-ichi Tanuma
4	04/27	Diseases of oral mucosa 2	Textbook 1 pp239-256		Jun-ichi Tanuma
5	05/11	Diseases of oral mucosa 3	Textbook 1 pp239-256		Jun-ichi Tanuma
6	05/18	Diseases of salivary gland 1	Textbook 1 pp257-270		Tatsuya Abé
7	05/25	Diseases of salivary gland 2	Textbook 1 pp271-282		Tatsuya Abé

8	06/01	Diseases of salivary gland 3	Textbook 1 pp271-282	Tatsuya Abé
9	06/08	Diseases of odontogenic tissue 1	Textbook 1 pp196-211	Manabu Yamazaki
10	06/15	Diseases of odontogenic tissue 2	Textbook 1 pp196-211	Manabu Yamazaki
11	06/22	Diseases of odontogenic tissue 3	Textbook 1 pp196-211	Manabu Yamazaki
12	06/29	Diseases of jaw and temporomandibular joint 1	Textbook 1 pp212-238	Manabu Yamazaki
13	07/06	Diseases of jaw and temporomandibular joint 2	Textbook 1 pp212-238	Manabu Yamazaki
14	07/13	Diseases of mesenchymal soft tissue 1	Textbook 1 pp212-238	Tatsuya Abé
15	07/20	Diseases of mesenchymal soft tissue 2	Textbook 1 pp212-238	Tatsuya Abé
16	07/27	Examination	The details will be given in class	Jun-ichi Tanuma
<p><b>【Evaluation】</b>  Examination (30%), Handing in papers (30%) and oral examinations (40%).</p> <p><b>【Media】</b>  Textbook 1: New Oral Pathology (3rd ed.) (Ishiyaku Pub., Inc.) 11,000 yen</p> <p><b>【Reference book】</b>  Easy-to-understanding Pathology (7nd ed.) (Nankodo Co., Ltd.) 2,970 yen</p> <p><b>【Reference website】</b>  Div. of Oral Pathology HP: <a href="http://www5.dent.niigata-u.ac.jp/~opatho/">http://www5.dent.niigata-u.ac.jp/~opatho/</a></p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5627	2	Tue/4, 5 :I	4	9013	Lecture・Seminar
230N5628		Tue/4, 5 :II			
Course	Ethics, Laws, and Regulations in Medical and Dental Sciences I , II				
Instructor	Assistant Prof. Satoru Hirayama (Division of Microbiology and Infectious Diseases) Prof. Yutaka Terao (Division of Microbiology and Infectious Diseases)				
Place	Room E418				
I・II					
<b>【Course outline】</b> This course deals with the essential knowledge in laws and regulations for Medical and Dental Sciences to understand the ethical considerations as a scientist.					
<b>【Course aim】</b> The aim of this course is to acquire fundamental knowledge of laws and regulations for the Medical and Dental researchers, and then to learn and understand the responsibilities as a scientist.					
<b>【Attainment target】</b> (1) Describe the important points and explain the responsibilities to promote research. (2) Describe the ethical considerations as a scientist. and explain the compliance with laws and regulations. (3) Practice the laws and regulations for the Medical and Dental sciences.					
<b>【Study method・attention】</b> In advance of this lesson, participants should read and understand the below textbook and references. Depending on the number of the students, we may perform actual seminar and discussion.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review	Instructor	
1	4/11	Responsibility of Scientists	Organize the main points	Yutaka Terao	
2	4/18	Responsible Research Activity	Organize the main points	Yutaka Terao	
3	4/25	Concept of Informed Consent	Organize the main points	Yutaka Terao	
4	5/2	Protecting Personal Information	Organize the main points	Yutaka Terao	
5	5/9	Purposes of Lab-Notes	Organize the main points	Satoru Hirayama	
6	5/16	Managing Lab-Notes and Data	Organize the main points	Satoru Hirayama	
7	5/23	Definition of Research Misconduct	Organize the main points	Satoru Hirayama	

8	5/30	Examples of Research Misconduct	Organize the main points	Satoru Hirayama
9	6/6	Avoiding of Research Misconduct	Organize the main points	Satoru Hirayama
10	6/13	Genetic Recombination Experiment	Organize the main points	Satoru Hirayama
11	6/20	Detailed Regulations for Genetic Recombination Experiment 1	Organize the main points	Satoru Hirayama
12	6/27	Detailed Regulations for Genetic Recombination Experiment 2	Organize the main points	Satoru Hirayama
13	7/4	Detailed Regulations for Genetic Recombination Experiment 3	Organize the main points	Satoru Hirayama
14	7/11	Detailed Regulations for Genetic Recombination Experiment 4	Organize the main points	Satoru Hirayama
15	7/18	Conclusion and Discussion	Keyword organization	Satoru Hirayama
16	7/25	Examination	Exam question review	Yutaka Terao

**【Evaluation】**

Written Examination 50%

Discussion and Debate 50%

**【Media】**

For the Sound Development of Science–The Attitude of a Conscientious Scientist–. (Japanese book ¥990 / English PDF [https://www.jsps.go.jp/j-kousei/data/rinri\\_e.pdf](https://www.jsps.go.jp/j-kousei/data/rinri_e.pdf))

**【Reference book】**

The research paper using in the lecture will be distributed in each practice.



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5629	Any time	Any time	4	9015	Lecture, Seminar, Practice
Course	International collaboration in the field of basic research				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	Basic research laboratories in the foreign countries				
<p><b>【Course outline】</b></p> <p>This course is intended as a complement to the current graduate school dental curriculum to promote and engage in basic research by enrolling students, for a certain period of time, in oversea laboratories in order to understand, train and develop advanced research. The students of this course are expected not only to continue their research activities after their return, but also to expand their international research network and contribute to the development of dental research. After returning, students are required to present the research results obtained in the international laboratories at academic meetings and submit academic reports. The duration of the travel and the research activities, shall be not less than 3 months and not more than 12 months.</p> <p><b>【Course aim】</b></p> <p>By enrolling in this course, the following outcomes are expected.</p> <ol style="list-style-type: none"><li>1. Improve communication skills in English, especially in the discussion of research topics.</li><li>2. A deeper understanding of basic research</li><li>3. Improve oral presentation skills in English</li><li>4. A better understanding of international research environments and the management system of the facilities.</li><li>5. Be able to objectively evaluate the research environment in your country</li></ol> <p><b>【Attainment target】</b></p> <ol style="list-style-type: none"><li>1. Research communication and mutual understanding in English.</li><li>2. Active involvement in basic research projects.</li><li>3. Make oral presentations in English.</li><li>4. Compare your research environment with research environments in other countries.</li><li>5. Explain the managements system of the research facilities in other countries.</li><li>6. Evaluate the research environment in your country.</li></ol> <p><b>【Study method・attention】</b></p> <p>Since students will actually enroll in an international basic research laboratory for a period of time, please take note and carefully consider the following points.</p> <ol style="list-style-type: none"><li>1. Communicate actively and positively in English.</li><li>2. Actively participate in all basic research activities during your stay.</li><li>3. Have a detail discussion with the person in charge of the laboratory in which you will be enrolled in advance.</li><li>4. Constantly check and collect all the information available in the home-page of the Ministry of Foreign Affairs.</li><li>5. Register the travel period of time and travel destination at the “Ministry of Foreign affairs registration office” .</li></ol>					

【Plan】				
No.	Date	Contents	Preparing learning	Instructor
1	Any time	Enrollment in a research laboratory overseas to engage in basic research.	Preliminary survey and meetings with foreign dental	Supervisors in Niigata/on-site
<p><b>【Evaluation】</b></p> <p>After returning to Japan, the results of the research activities conducted at the overseas basic research laboratories must be presented in a detailed report. This report will be evaluated by the Graduate School of Medicine and Dentistry Comprehensive Studies, Dental School Affairs Committee Members, and determine if the expected outcomes corresponding to overseas traveling period has been obtained. In addition, the results must be presented at an academic meeting within six months of returning home.</p> <p>If the above two points are met, it will be certified as a credit for the fiscal year corresponding to the date of the presentation at the academic meeting.</p> <p><b>【Media】</b></p> <p>Appropriate academic literature and text books related to basic research methods will be designated.</p> <p><b>【Reference book】</b></p> <p>Appropriate scientific literature will be designated.</p>				

Designated Subjects  
(Elective Subjects •  
Course works for clinical dentistry)

**Designated Subjects (Elective Subjects · Course works for clinical dentistry)**

Course	Page
Course for Basic Global Oral Health I, II	43
Course for Practical Clinical Endodontics I, II	47
Course Work of Pediatric Dentistry I, II	49
Basics of Clinical Prosthodontics I	51
Basics of Clinical Prosthodontics II	53
Course work related to Oral and Maxillofacial Surgery I, II	55
Course work related to periodontology I, II	58
A Basic Course for Clinical Orthodontics I, II	60
Corse for functional evaluation of stomatognathic system IA, IIA, IB, IIB	63
Course work of comprehensive prosthodontics I, II	65
Seminar on Diagnosis, Treatment and Postoperative Evaluation of Oral and Maxillofacial Diseases, I II	68
Dental Radiology Course Work I, II	70
Basic science course for pain I, II	73

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5630	Year	TUE/2・I	4	9113	Lecture
230N5631		TUE/7・II			
Course	Course for Basic Global Oral Health I, II				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry) Assistant Prof. Kaung Myat Thwin (Div. Preventive Dentistry)				
Place	Seminar room (Div. Preventive Dentistry)				
<p><b>【Course outline】</b></p> <p>Oral and craniofacial diseases and disorders are amongst the most common health problems in all regions of the world. This course work aims to provide knowledge for global oral health promotion as based on the WHO Global Oral Health Programme, and train its policy in a global sense.</p> <p><b>【Course aim】</b></p> <p>This course will cover several thematic units (basic philosophy, epidemiology of oral diseases, etiologies of oral disease, social and culture risk factors, prevention of oral disease in public health). It is also excellent preparation for the WHO Global Oral Health Internship Programme.</p> <p><b>【Attainment target】</b></p> <p>This course is designed to help English skills in the international dentistry. The aim is to give the students confidence to discuss, present and write papers about global oral health in English.</p> <p><b>【Study method・attention】</b></p> <p>In this tutorial, each of content will include a lecture component and a group discussion component. The students will not be permitted to apply the WHO Global Oral Health Internship Programme unless fulfill course requirement. Lecture materials will be provided prior to each lecture.</p>					
I		【Plan】			
No.	Date	Contents	Preparing learning		Instructor
1	April 11	Guidance	Lecture materials will be suggested accordingly		OGAWA Hiroshi
2	April 18	Introduction of Global health	Lecture materials will be suggested accordingly		OGAWA Hiroshi
3	April 25	Policy and management	Lecture materials will be suggested accordingly		OGAWA Hiroshi
4	May 2	Ethics and decision making	Lecture materials will be suggested accordingly		OGAWA Hiroshi
5	May 9	Qualitative and field methods	Lecture materials will be suggested		OGAWA Hiroshi

			accordingly	
6	May 16	Basic statistics in global health I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	May 23	Basic statistics in global health II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	May 30	Global oral epidemiology	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	June 6	Epidemiological study methods	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	June 13	Design and implementation of survey	Lecture materials will be suggested accordingly	OGAWA Hiroshi
11	June 20	Standardization and calibration	Lecture materials will be suggested accordingly	OGAWA Hiroshi
12	June 27	Assessment form and criteria	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	July 4	Clinical assessment	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	July 11	Questionnaires and interviewing	Lecture materials will be suggested accordingly	OGAWA Hiroshi
15	July 18	Global trend of dental caries prevalence	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
16	July 25	Summary and discussion	Review the course	OGAWA Hiroshi Kaung Myat Thwin
<b>II</b>		<b>【Plan】</b>		
<b>No.</b>	<b>Date</b>	<b>Contents</b>	<b>Preparing learning</b>	<b>Instructor</b>
1	October 3	Global trend of periodontal disease prevalence	Lecture materials will be suggested	OGAWA Hiroshi Kaung Myat

			accordingly	Thwin
2	October 10	Global trend of oral cancer/precancer prevalence	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
3	October 17	Global Oral Health Information System, CAPP	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
4	October 24	Global Oral Health Information System, GODB	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
5	October 31	Global trend of topical fluoride application	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
6	November 7	Global trend of systemic fluoride application	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
7	November 14	Common risk factors: diet, nutrition and oral health	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	November 21	Common risk factors: tobacco and oral health	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	November 28	HIV/AIDS and oral health	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	December 5	Oral health promotion for developing nations	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
11	December 12	Oral health promotion for developed nations	Lecture materials will be suggested accordingly	OGAWA Hiroshi Kaung Myat Thwin
12	December 19	Oral health policy development: A global perspective	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	December 26	Operational research for global oral health	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	January 16	Operational research for global oral health	Lecture materials will be suggested accordingly	OGAWA Hiroshi

15	January 23	Summary and discussion	Review the course	OGAWA Hiroshi Kaung Myat Thwin
16	January 30	Presentation	Preparation for presentation	OGAWA Hiroshi Kaung Myat Thwin
<p><b>【Evaluation】</b>  Evaluated by debates (20%), assignments (50%) and presentations (30%).</p> <p><b>【Media】</b>  WHO World Oral Health Report, etc WHO publications.</p> <p><b>【Reference book】</b>  References will be indicated if required.</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5632	1	Thu/6, 7・I	4	9113	Lectures, demonstrations, and laboratory practices
230N5633		Thu/6, 7・II			
Course	Course for Practical Clinical Endodontics I, II				
Instructor	Prof. Yuichiro Noiri (Div. of Cariology, Operative Dentistry & Endodontics) Associate Prof. Shouj Takenaka (Div. of Cariology, Operative Dentistry & Endodontics) Assistant Prof. Naoki Edanami (Div. of Cariology, Operative Dentistry & Endodontics)				
Place	Laboratory at the Div. Cariology, Operative Dentistry & Endodontics, Simulation laboratory (3F) and Clinic of Operative Dentistry & Endodontics				
I・II					
<b>【Course outline】</b> This course provides a combination of both the practical and theoretical essentials of advanced endodontic treatment required for students who wish to extend knowledge and skills in endodontics and/or to become an accredited specialist in this discipline. The program is comprised of (i) lectures on contemporary endodontics, (ii) demonstrations and lab exercises to acquire clinical skills, and (iii) seminars to develop a critical appreciation of the relevant literature and give an introduction to research methodology.					
<b>【Course aim】</b> In this course, students wishing to offer patients specialized endodontic treatment learn the principles of the state-of-the-art in endodontics and receive training on specialized treatment techniques under simulated conditions.					
<b>【Attainment target】</b> After completing this course, the student should be able to: 1. Describe an outline of current progresses in the art and science of endodontics. 2. Describe objectives, indication and techniques regarding the use of operating microscope in non-surgical endodontic treatment. 3. Operate the microscope for non-surgical endodontic treatment under simulated condition. 4. Describe techniques for shaping canals using NiTi rotary instruments. 5. Discuss current topics in root canal irrigation. 6. Prepare simulated canals and extracted teeth with NiTi rotary instruments and evaluate resulting canal shape. 7. Discuss current topics in root canal obturation. 8. Obturate root canals using different techniques. 9. Describe objectives, indication and techniques regarding the use of operating microscope in surgical endodontic treatment. 10. Operate the microscope for surgical endodontic treatment under simulated condition.					
<b>【Study method・attention】</b> Lectures, demonstrations, and laboratory practices We will indicate learning contents and methods without lecture at the beginning of the course.					

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	4/6	Introduction Trends and controversies in current endodontics	The details will be provided at the first lecture.	Yuichiro Noiri
2-4	4/13 4/20 4/27	Microendodontics 1. Non-surgical endodontic treatment - Objectives and indication - Usage of operating microscope and ultrasonic devices/instruments - Canal orifice location, broken instrument removal, perforation repair	Original handouts	Yuichiro Noiri Shouji Takenaka Naoki Edanami
5-7	5/11 5/18 5/25	Chemomechanical root canal preparation - Ni-Ti rotary preparation - Current concepts in canal irrigation - Evaluation of canal preparation	Original handouts	Yuichiro Noiri Shouji Takenaka Naoki Edanami
8-10	6/8 6/15 6/29	Microendodontics 2. Surgical endodontic treatment - Objectives, indication and techniques of endodontic microsurgery - Apicoectomy and retrofilling with MTA	Original handouts	Yuichiro Noiri Shouji Takenaka Naoki Edanami
11-13	7/6 7/13 7/20	Microendodontics 2. Surgical endodontic treatment - Objectives, indication and techniques of endodontic microsurgery - Apicoectomy and retrofilling with MTA	Original handouts	Yuichiro Noiri Shouji Takenaka Naoki Edanami
14, 15	7/27 8/3	Clinical attendance - microendodontics - Ni-Ti rotary preparation - Warm gutta-percha techniques	Original handouts	Yuichiro Noiri Shouji Takenaka Naoki Edanami
16	8/10	Examination & Seminar	Review	Yuichiro Noiri
<b>【Evaluation】</b> Oral examination (40%) Practical assessment (30%) Assessment of seminar presentation (30%) <b>【Media】</b> Course manual; Practical Clinical Endodontics (Div. Cariology, Operative Dentistry & Endodontics) <b>【Reference book】</b> Textbook of Endodontology 3rd ed. (Bergenholtz G <i>et al.</i> , Wiley-Blackwell, 2018) 16,252yen Pathways of the Pulp, 11th ed. (Cohen S and Hargreaves KM, Mosby Elsevier, 2015) 20,693yen				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5634	1	Fri 3,4・I	4	9113	Seminar
230N5635		Fri 6,7・II			
Course	Course Work of Pediatric Dentistry I, II				
Instructor	Prof. HAYASAKI, Haruaki (Div. Pediatric Dentistry) Assistant Prof. NAKAJIMA, Tsutomu (Div. Pediatric Dentistry)				
Place	Seminar Room in Division of Pediatric Dentistry				
I・II					
<b>【Course outline】</b> Pediatric Dentistry is not a department for specific treatments, but for persons, i.e., children. The aim of dental treatment is to cure, habilitate and rehabilitate oral functions. Therefore, taking into this aim into consideration, understanding of growth and development are indispensable. The students are expected to grasp, especially the knowledge of general human and oro-facial growth, and oral functions.					
<b>【Course aim】</b> The course deals with 1) mandibular motion, 2) functions of the lip, 3) respiratory functions, 4) occlusal contacts in primary dentition, for better understanding of Pediatric Dentistry.					
<b>【Attainment target】</b> To explain general growth of human body. To explain oro-facial growth. To explain the development of oro-facial functions.					
<b>【Study method・attention】</b> Read and understand the prepared literatures thoroughly by yourself before every lecture, and join in the discussion actively on every lecture. Styles of class are lecture and group study.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	4/7	Outline of CWPD	The details are instructed during the course.		HAYASAKI Haruaki
2	4/14	General Growth of Child (1)	Textbook1 pp150～183		HAYASAKI Haruaki
3	4/21	General Growth of Child (2)	Textbook1 pp248～257		HAYASAKI Haruaki
4	4/28	General Growth of Child (3)	Textbook1 pp412～422		HAYASAKI Haruaki
5	5/12	Growth of Oro-Facial Region (1)	Textbook1 pp184～199		NAKAJIMA Tsutomu
6	5/19	Growth of Oro-Facial Region (2)	Textbook1 pp258～278		NAKAJIMA Tsutomu
7	5/26	Growth of Oro-Facial Region (3)	Textbook1 pp423～459		NAKAJIMA

				Tsutomu
8	6/2	Mandibular Movement of Children (1)	Textbook1 pp566~574	HAYASAKI Haruaki
9	6/9	Mandibular Movement of Children (2)	Textbook1 pp575~585	NAKAJIMA Tsutomu
10	6/16	Evaluation of Lip Function	Textbook1 pp385~392	NAKAJIMA Tsutomu
11	6/23	Respiration of Children (1)	Textbook1 pp81~87	HAYASAKI Haruaki
12	6/30	Respiration of Children (2)	Textbook1 pp352~370	HAYASAKI Haruaki
13	7/7	Occlusal Contacts of Children (1)	Textbook1 pp379~384	NAKAJIMA Tsutomu
14	7/14	Occlusal Contacts of Children (2)	Textbook1 pp393~397	Nakajima Tsutomu
15	7/21	Examination	Previous review.	HAYASAKI Haruaki
<p><b>【Evaluation】</b>  Oral test or written examination (50%) and report (50%).</p> <p><b>【Media】</b>  1. Textbook  (1) Pediatric Dentistry – Infancy Through Adolescence-. WB Saunders Company. ISBN 0-7216-4695-6.</p> <p><b>【Reference book】</b>  1. Reference Books  (1) Functional Occlusion. PE Dawson. MDP Company. ISGN 978-263-44313-2.</p> <p>2. Reference Journals  (1) Pediatric Dentistry  (<i>Journal of American Academy of Pediatric Dentistry</i>)  (2) International Journal of Paediatric Dentistry  (<i>Journal of the British Society of Paediatric and the International Journal of Pediatric Dentistry</i>)  (3) Pediatric Dental Journal  (<i>International Journal of Japanese Society of Pediatric Dentistry</i>)  (4) The Journal of Clinical Pediatric Dentistry</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5636	1	Tue/6 I A	2	9113	Lecture and seminar
		Tue/6 II A			
Course	Basics of Clinical Prosthodontics I				
Instructor	Katsumi Uoshima/Nami Akiba				
Place	C416 Refresh room				
I・II					
<p>【Course outline】</p> <p>Lectures will be given about the basics of clinical prosthodontics. There are several options to replace missing teeth including RPD, FPD and dental implants. To improve the prognosis of prosthodontic treatments, it' s very important to diagnose and provide appropriate treatment plans to each patient. In this course, you will learn the basic of prosthodontics in the former half and we will discuss more concrete solutions of actual clinical cases in the latter half.</p> <p>【Course aim】</p> <p>To provide appropriate prosthodontic treatments to the patients, you will learn the basics and clinical aspects of prosthodontics. You will also learn the knowledge required for prosthodontic specialist.</p> <p>【Attainment target】</p> <p>1. To explain prosthodontics terms.</p> <p>2. To explain prosthodontic techniques</p> <p>3. To enumerate the problems of actual patient cases.</p> <p>4. To enumerate the options of prosthodontic treatments.</p> <p>5. To explain the techniques concretely.</p> <p>【Study method・attention】</p> <p>Please prepare your actual and selected patients' information if possible. Necessary text will be provided prior to the lectures and please study these contents in advance.</p>					
【Plan】					
No.	Date	Contents	Preparation and Review	Instructor	
1	4/4	Guidance	The details will be given in the lecture.	Akiba N	
2	4/11 4/18	Outline of Prosthodontics	Preparing learning with provided text.	Uoshima・Akiba N	
3	4/25 5/2 5/9 5/16 5/23	Methodology of prosthodontics	Preparing learning with provided text.	Uoshima・Akiba N	
4	5/30 6/6	Case based discussion	Preparing learning with provided text.	Uoshima・Akiba	

	6/13 6/20 6/27 7/4			
5	7/11	Conclusion and examination	Review of previous lectures	Uoshima
<p><b>【Evaluation】</b>  Scores will be given according to the attendance attitude (20%), quality of reports (40%) and oral examination (40%).</p> <p><b>【Media】</b>  To be announced during the course. The handout will be provided in each lecture.</p> <p><b>【Reference book】</b>  To be announced during the course.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5637	1	Wed/7・IIA	2	9113	Lecture・practice
Course	Basics of Clinical ProsthodonticsII				
Instructor	Prof. Katsumi Uoshima / Asst. Prof. Yujin Aoyagi				
Place	C412 Common Seminar Room				
I・II	<p>【Course outline】</p> <p>Attendants will be expected to discuss and think about the selection of clinical options through reading clinical references. Several themes will be given each time in every 2 or 3 lectures and you will be required to seek related articles. Discussion will be held based on these references.</p> <p>【Course aim】</p> <p>To provide appropriate prosthodontic treatments to the patients, you will learn the clinical aspects of prosthodontics.</p> <p>【Attainment target】</p> <ol style="list-style-type: none"><li>1. To find the appropriate references.</li><li>2. To read the English papers.</li><li>3. To summarize English papers.</li><li>4. To enumerate the options of prosthodontic treatments.</li><li>5. To explain the techniques concretely.</li></ol> <p>【Study method・attention】</p> <p>Please be ready to used PubMed or other databases. Necessary text will be provided prior to the lectures and please study these contents in advance.</p>				
【Plan】					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/5	Guidance	The details will be given in the lecture.	Aoyagi	
2-4	4/12 4/19 4/26	Discussion on references 1	Select an interesting paper and discuss it.	Uoshima/ Aoyagi	
5-7	5/10 5/17 5/24	Discussion on references 2	Select an interesting paper and discuss it.	Uoshima/ Aoyagi	
8	5/31	Conclusion of 1 and 2	Review and summary of 1 and 2.	Uoshima/ Aoyagi	

9-11	6/7 6/14 6/21	Discussion on references 3	Select an interesting paper and discuss it.	Uoshima/ Aoyagi
12-14	6/28 7/5 7/12	Discussion on references 4	Select an interesting paper and discuss it.	Uoshima/ Aoyagi
15	7/19	Conclusion of 3 and 4	Review and summary of 3 and 4.	Uoshima/ Aoyagi
16	7/26	Examination	Evaluate the reviews and summaries.	Uoshima/ Aoyagi
<p><b>【Evaluation】</b>  Scores will be given according to the attendance (20%) and quality of reports (80%) that will be required occasionally.</p> <p><b>【Media】</b>  To be announced during the course.</p> <p><b>【Reference book】</b>  To be announced during the course.</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5638	1	Tue/5 I	4	9113	Lecture・Seminar・Practice
230N5639		Tue/6 II			
Course	Course work related to Oral and Maxillofacial Surgery I, II				
Instructor	Associate Professor Hideaki Hirai.				
Place	Laboratory in Div. Oral and Maxillofacial Surgery.				
I・II					
<p>【Course outline】</p> <p>This seminar course deals with inflammation, cyst and fracture occurring in the oral and maxillofacial region. We study diagnosis, treatment and prevention of these diseases, and discuss on the prognosis of various surgical treatment techniques.</p> <p>【Course aim】</p> <p>The course is designed to learn diagnostic methods, treatment planning and basic technique for a specialist of oral surgery.</p> <p>【Attainment target】</p> <p>① To explain the diagnosis and treatment of inflammations.</p> <p>② To explain the diagnosis and treatment of cystic lesions.</p> <p>③ To explain the diagnosis and treatment of fractures.</p> <p>④ To master the basic technique of oral surgeries.</p> <p>⑤ To explain the extraction of an impacted wisdom teeth and its complications.</p> <p>⑥ To explain the alveolar ridge augmentation for dental implant.</p> <p>⑦ To select and order some examinations for adequate diagnosis of oral disease.</p> <p>⑧ To explain the pre- and post-surgical management of the patients with orofacial lesions.</p> <p>【Study method・attention】</p> <p>Lecture: The guidance or this course</p> <p>Simulation: To master the basic technique of oral surgeries</p> <p>Patient practice: Managements of out and/or in patients at our clinic</p> <p>Presentation and discussion of some cases and reports by e-mail.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance	The details are instructed in the class.		Hirai
2	4/18	The diagnosis of the Inflammation and the infection	The details are instructed in the class.		Hirai
3	4/25	How to control the inflammation and the infection	The details are instructed in the class.		Hirai

4	5/9	Inflammation.	The details are instructed in the class.	Hirai
5	5/16	Diagnosis of the Cyst.	The details are instructed in the class.	Hirai
6	5/23	Treatment of the Cyst.	The details are instructed in the class.	Hirai
7	5/30	Diagnosis of the Fractur	The details are instructed in the class.	Hirai
8	6/6	Treatment of the Fracture..	The details are instructed in the class.	Hirai
9	6/13	Oral surgery concerning with teeth and alveolar bone.	The details are instructed in the class.	Hirai
10	6/20	Oral surgery concerning with teeth and alveolar bone.	The details are instructed in the class.	Hirai
11	6/27	How to extract an impacted wisdom teeth.	The details are instructed in the class.	Hirai
12	7/4	Complications association with a wisdom teeth extraction.	The details are instructed in the class.	Hirai
13	7/11	Alveolar ridge augmentation for dental implants (Bone graft).	The details are instructed in the class.	Hirai
14	7/18	Alveolar ridge augmentation for dental implants (Sinus lift).	The details are instructed in the class.	Hirai
15	8/1	Alveolar ridge augmentation for dental implants (Vertical alveolar distraction).	The details are instructed in the class.	Hirai
16	8/8	Examination.	The details are instructed in the class.	Hirai

**【Evaluation】**

Clinical presentation and report are main events of evaluation (50%), additionally questions and answers (50%) .

**【Media】**

We indicate some guideline for Oral and Maxillofacial surgery.

**【Reference book】**

We indicate research paper if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5640	1	Mon/3・4 I	4	9113	Lecture・Seminar
230N5641		Mon/3・4 II			
Course	Course work related to periodontology I, II				
Instructor	Associate Prof. Naoki Takahashi, Lecturer. Yukari Nonaka				
Place	Laboratory (E411) at Division of Periodontology,E4 Refresh room (E417)				
I・II					
<b>【Course outline】</b> Periodontal diseases are multifactorial and inflammatory diseases. It is important to conduct the treatment following a comprehensive system based on a strategic treatment planning. The course is based on lectures and discussions about basic and practical knowledge for periodontal therapy.					
<b>【Course aim】</b> The aim of this course is to learn basic and practical knowledge about etiology, emergency treatment, medical interview, basic periodontal examination, diagnosis, treatment planning, plaque control, scaling and root planing, drug therapeutics, occlusal adjustment, periodontal surgery, furcation treatment, splint, restorative therapy, maintenance and supportive periodontal treatment, and case presentation.					
<b>【Attainment target】</b> Students will be able to 1) explain basic knowledge and concept for periodontal therapy. 2) explain the background and evidences related to key techniques for each periodontal treatment. 3) perform case presentation of periodontal therapy.					
<b>【Study method・attention】</b> The basic knowledge will be provided by lecture and discussion. Students are required to read the reference books prior to the lesson.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10	Etiology and symptom	Textbook① pp15-22		Takahashi Nonaka
2	4/17	Emergency treatment	Textbook① pp127-137		Takahashi Nonaka
3	4/24	Medical interview	Textbook① pp96-107		Takahashi Nonaka
4	5/1	Basic periodontal examination	Textbook① pp96-107		Takahashi Nonaka
5	5/8	Diagnosis	Textbook① pp108-115		Takahashi Nonaka
6	5/15	Treatment planning	Textbook① pp108-115		Takahashi

				Nonaka
7	5/22	Plaque control	Textbook① pp183-148	Takahashi Nonaka
8	5/29	Scaling and root planning	Textbook① pp149-164	Takahashi Nonaka
9	6/5	Drug therapeutics	Textbook① pp318-327	Takahashi Nonaka
10	6/12	Occlusal adjustment	Textbook① pp168-172	Takahashi Nonaka
11	6/19	Periodontal surgery	Textbook① pp181-196	Takahashi Nonaka
12	6/26	Furcation treatment	Textbook① pp245-256	Takahashi Nonaka
13	7/3	Splint, restorative therapy	Textbook① pp273-280	Takahashi Nonaka
14	7/10	Maintenance and supportive periodontal treatment	Textbook① pp309-317	Takahashi Nonaka
15	7/24	Case presentation, Summary Examination	Textbook① pp345-355	Takahashi Nonaka
<p><b>【Evaluation】</b> Classroom attitude (30%), report (70%)</p> <p><b>【Media】</b> ① Clinical Periodontology 3<sup>rd</sup> edition (ISBN978-4-263-45844-0, Ishiyaku Publishers, Inc., 11,000yen)</p> <p><b>【Reference book】</b> • Regeneration (ISBN978-4-87417-881-2, Quintessence Publishing, 14,300yen) • Dental Regenerative Medicine (ISBN978-4-263-45838-9, Ishiyaku Publishers, Inc., 16,500yen)</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5642	1	Wed/6, 7 I	4	9113	Lecture・Seminar・Practice
230N5643		Wed/6, 7 II			
Course	A Basic Course for Clinical Orthodontics I, II				
Instructor	Prof. Isao Saito (Div. Orthodontics) Assistant Prof. Yuko Oomori (Div. Orthodontics)				
Place	Seminar room for practice or cephalometric analysis, or orthodontic clinic				
I・II					
<b>【Course outline】</b> This course work will offer lectures on orthodontic treatment concept, orthodontic diagnosis, and edgewise system in clinical orthodontics. The postgraduates taking this course will also have experiences in skills for cephalometric analysis, case analysis for various types of malocclusion, and wire bending.					
<b>【Course aim】</b> This course work provides the students with fundamental knowledge and a part of skills for basic orthodontic management in dental practice and applying an accredited orthodontist.					
<b>【Attainment target】</b> Participant(s) can; <ul style="list-style-type: none"><li>• Explain orthodontic treatment concept</li><li>• Explain methods for cephalometric analysis</li><li>• Perform cephalometric tracing</li><li>• Diagnose various types of malocclusions</li><li>• Summarize the edgewise treatment</li><li>• Perform basic wire bending including ideal arch wires</li></ul>					
<b>【Study method・attention】</b> Documents are supposed to be distributed at the beginning of each lecture. Participants will be required to read the textbook and/or references designated before attending.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review	Instructor	
1	4/5	Orthodontic treatment concept 1	Read through distributed documents, and those related references	Saito	
2	4/12	Materials for orthodontic diagnosis	Read through distributed documents, and those related references	Saito, Takahashi	
3	4/19	Cephalometric analysis	Arrange and summarize documents distributed	Saito	

4	4/26	Cephalometric tracing 1	Arrange and summarize documents distributed	Saito, Takahashi
5	5/10	Cephalometric tracing 2	Arrange and summarize documents distributed	Saito, Takahashi
6	5/17	Analysis and diagnosis in orthodontics	Read through distributed documents, and those related references	Saito
7	5/31	Growth and development in orthodontics 1	Read through distributed documents, and those related references	Saito, Takahashi
8	6/14	Growth and development in orthodontics 2	Read through distributed documents, and those related references	Saito, Takahashi
9	6/21	Case analysis for mandibular prognathism	Look through distributed materials for case analysis	Saito, Takahashi
10	6/28	Case analysis for maxillary protrusion	Look through distributed materials for case analysis	Saito, Takahashi
11	7/5	Surgical orthodontic treatment	Read through distributed documents, and those related references	Saito
12	7/12	Summary of edgewise system and adult orthodontic treatment	Read through distributed documents, and those related references	Saito
13	7/19	Wire bending exercise 1	Verify the method of bending wires	Saito, Takahashi
14	7/26	Wire bending exercise 2	Verify the method of bending wires	Saito, Takahashi
15	8/2	Overall discussion	Arrange problems pertaining to the course	Saito, Takahashi

16	8/9	Exam (interview)	Arrangement and understanding of contents provided in the course	Saito
<p><b>【Evaluation】</b>  The participant(s) will be assessed by reports submitted (40%), interviews for case analysis (40%) and practical products (20%) such as several wires bended or cephalometric tracings.</p> <p><b>【Media】</b>  The textbook of CONTEMPORARY ORTHODONTICS (5<sup>th</sup> edition; W. Proffit, ed., Mosby Year Book, Inc.) (15,108 yen including tax) and relevant papers in each content.  Orthodontics for Dental Students (13,000 yen+tax)</p> <p><b>【Reference book】</b>  Edgewise System Vol. 1 (42,000 yen + tax)</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5644	1	Mon/1・I	2	9113	Lecture, Practice
230N5646		Mon/6・II			
Course	Corse for functional evaluation of stomatognathic system IA, IIA, IB, IIB				
Instructor	Prof. Makoto Inoue (Div. Dysphagia Rehabilitation) Associate Prof. Takanori Tsujimura (Div. Dysphagia Rehabilitation)				
Place	Seminar room (C5F), Dysphagia Rehabilitation Clinic at 2F, Clinic for outpatients at 5F				
I・II					
<b>【Course outline】</b> Human need not only teeth but also surrounding muscles and nerves to accomplish normal stomatognathic function. The students are expected to grasp the knowledge of evaluating the functions to diagnose whether they are normal or abnormal.					
<b>【Course aim】</b> The course deals with the methodology for evaluation of stomatognathic function including mastication, swallowing, phonation and respiration.					
<b>【Attainment target】</b> The students will correctly understand anatomy and physiology of mastication- and swallow-related organs. The students will appropriately explain the examination for evaluation of stomatognathic function.					
<b>【Study method・attention】</b> The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/10	Guidance	Out-of-Class Study	Inoue, Tsujimura	
2, 3	4/17, 24	Neuroanatomy and physiology of ingestion; peripheral function	Read handout before lecture	Inoue, Tsujimura	
4, 5, 6	5/1, 8, 15	Neuroanatomy and physiology of ingestion; brainstem function	Read handout before lecture	Inoue, Tsujimura	
7, 8, 9	5/22, 29, 6/5	Neuroanatomy and physiology of ingestion; higher brain function	Read handout before lecture	Inoue, Tsujimura	
10, 11, 12	6/12, 19, 26	Electromyography (EMG); principle and technical issue	Read handout before lecture	Inoue, Tsujimura	
13, 14, 15	7/3, 10, 24	Technical issues and assessment of surface and needle EMG recordings	Read handout before lecture	Inoue, Tsujimura	
16	7/31	Examination (possible, on remote)	Read handout before	Inoue,	

			examination	Tsujimura
<p><b>【Evaluation】</b>  Written examination (80%) and attitude (20%).</p> <p><b>【Media】</b>  Handout supplied by Div. Dysphagia Rehabilitation</p> <p><b>【Reference book】</b>  Dysphagia Clinical management in Adults and Children (Elsevier)</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5648	1	Tue. 1st-2nd Lec.	4	9113	Lecture
230N5649		Tue. 6th-7th Lec.			Observation Exercise
Course	Course work of comprehensive prosthodontics I, II				
Instructor	Associate Prof. Kazuhiro Hori (Div. Comprehensive Prosthodontics) Lecturer Yoko Hasegawa (Div. Comprehensive Prosthodontics)				
Place	C4 Seminar Room, Clinic of Comprehensive Prosthodontics				
I・II					
<b>【Course outline】</b> This course work includes the lecture, clinical case presentation and PBL, which provides knowledge for diagnosing functional problems such as masticatory, swallowing and articulatory disorders and for applying an adequate prosthodontic approach to patients with maxillofacial defect or systemic disease.					
<b>【Course aim】</b> Recent diversity of functional disturbance, physical condition and living environment of patients has made the conventional system of prosthodontics based on the type of prosthesis less effective in our hyper-aged society. This course work of “Comprehensive prosthodontics” is established for training the professional clinician and researcher who can develop the innovative prosthodontic approach based on the objective functional diagnosis.					
<b>【Attainment target】</b> 1. To explain normal and abnormal aspect of mastication and swallowing. 2. To explain and perform the evaluation of masticatory function. 3. To explain the impact of masticatory and swallowing disorders on the quality of life. 4. To explain eating and communication disorders in oral cancer patients. 5. To explain the concept of removable denture designing. 6. To explain the morphological consideration of removable partial denture. 7. To explain the maintenance of removable denture in the long time course. 8. To explain the each appliance in the maxillofacial prosthetics. 9. To plan the application of prosthesis in the rehabilitation medicine.					
<b>【Study method・attention】</b> Detail of preparation for each lecture will be shown in the first lecture. Students have to read recommended articles and textbook before the lecture.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/11	From mastication to swallow; normal aspects	Book 1, 2) Additional materials	Kazuhiro Hori	
2	4/18	How to assess mastication (1) objective assessment	Book 1, 2) Additional materials	Kazuhiro Hori	
3	4/25	How to assess mastication (2) subjective assessment	Book 1, 2)	Kazuhiro	

			Additional materials	Hori
4	5/2	How masticatory disability relates swallowing	Book 1,2) Additional materials	Kazuhiro Hori
5	5/9	Impact of masticatory-swallowing disability on QOL	Book 1,2) Additional materials	Yoko Hasegawa
6	5/16	Masticatory-swallowing-speech disability in post-surgical oral cancer patients	Book 3-5) Additional materials	Kazuhiro Hori
7	5/23	Concept of removal denture design (how to establish support, bracing and retention)	Book 6,7) Additional materials	Yoko Hasegawa
8	5/30	Concept of removal denture design (mucosal, polished and occlusal surface)	Book 6,7) Additional materials	Yoko Hasegawa
9	6/6	Long-term adjustment and repair of removable denture	Book 6,7) Additional materials	Yoko Hasegawa
10	6/13	Maxillofacial prosthetics (1) obturator prosthesis	Book 3-5) Additional materials	Kazuhiro Hori
11	6/20	Maxillofacial prosthetics (2) PAP and PLP	Book 3-5) Additional materials	Kazuhiro Hori
12	6/27	Maxillofacial prosthetics (3) facial prosthesis	Book 3-5) Additional materials	Kazuhiro Hori
13	7/4	PBL: Prosthodontic approach in physical rehabilitation (1)	Book 2,8,9) Additional materials	Kazuhiro Hori
14	7/11	PBL: Prosthodontic approach in physical rehabilitation (2)	Book 2,8,9) Additional materials	Kazuhiro Hori
15	7/18	Future research subjects	Additional materials	Kazuhiro Hori
16	7/25	Examination		Kazuhiro Hori

#### 【Evaluation】

Written examination (50%) and report (30%)

Presentation in the problem based learning (20%)

#### 【Media】

The related references will be distributed

#### 【Reference book】

- 1) 『新よくわかる顎口腔機能』(医歯薬出版)
- 2) 『成人～高齢者向け 咀嚼機能アップ BOOK』(クインテッセンス出版)
- 3) 『口腔中咽頭がんのリハビリテーション』(医歯薬出版)
- 4) 『新版 摂食・嚥下機能改善と装置の作り方超入門』(クインテッセンス出版)
- 5) 『歯科医師のための構音障害ガイドブック』(医歯薬出版)

- 6) 『無歯顎補綴治療学（第4版）』（医歯薬出版）
- 7) 『聞くに聞けない補綴治療 100』（デンタルダイヤモンド社）
- 8) 『嚥下障害の臨床』（医歯薬出版）
- 9) 『嚥下障害の臨床 実践編』（医歯薬出版）

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5650	1	Thu/4・5・I	4	9113	Lecture
230N5651		Thu/6・7・II			
Course	Seminar on Diagnosis, Treatment and Postoperative Evaluation of Oral and Maxillofacial Diseases, I II				
Instructor	Professor Tadaharu Kobayashi (Div. Reconstructive Surgery for Oral and Maxillofacial Region) Associate Professor Kanae Niimi (Patient Support Center, Niigata University Medical and Dental Hospital)				
Place	Conference Room in Div. Reconstructive Surgery for Oral and Maxillofacial Region, Clinic of Oral and Maxillofacial Surgery				
I・II					
<p>【Course outline】</p> <p>This seminar is designed to learn diagnostic methods, treatment planning, techniques of surgeries, reconstruction of the tissue defect, and postoperative morphological and functional assessments for oral and maxillofacial diseases.</p> <p>【Course aim】</p> <p>The aim of this course is to master basic knowledge and technique to diagnose, treat and evaluate oral and maxillofacial diseases as a specialist of oral and maxillofacial surgery.</p> <p>【Attainment target】</p> <ul style="list-style-type: none"><li>• To collect necessary materials and data for adequate diagnosis of oral and maxillofacial diseases.</li><li>• To diagnose oral and maxillofacial diseases.</li><li>• To make a plan of treatment from the diagnosis.</li><li>• To explain techniques of oral and maxillofacial surgeries.</li><li>• To master basic techniques of oral and maxillofacial surgeries.</li><li>• To assist oral and maxillofacial surgeries and manage the patients.</li><li>• To make a postoperative assessment of surgical treatment.</li></ul> <p>【Study method・attention】</p> <p>This cause consists of lecture using some documents, slides and moving images. Students have to do research beforehand using textbooks or any source materials. The contents of each preparation are presented at a first seminar.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/6	Guidance	Read Chapter 2 of the textbook before class		Kobayashi T
2	4/13	Clinical examination for diagnosis	Read Chapter 2 of the textbook before class		Niimi K
3	4/20	Diagnostic imaging	Read Chapter 2 of the textbook before class		Niimi K

4	4/27	Inflammation	Read Chapter 5 of the textbook before class	Niimi K
5	5/11	Trauma	Read Chapter 4 and 8 of the textbook before class	Niimi K
6	5/18	Mucosal disease / disease of the salivary gland	Read Chapter 6 and 10 of the textbook before class	Niimi K
7	5/25	Temporomandibular joint disease	Read Chapter 9 of the textbook before class	Kobayashi T
8	6/1	Developmental anomalies	Read Chapter 3 of the textbook before class	Kobayashi T
9	6/8	Benign tumor	Read Chapter 7 of the textbook before class	Kobayashi T
10	6/15	Malignant tumor	Read Chapter 17 of the textbook before class	Kobayashi T
11	6/22	Surgical treatment techniques	Read Chapter 13 of the textbook before class	Kobayashi T
12	6/29	Reconstruction of the tissue defect	Read Chapter 14 and 15 of the textbook before class	Kobayashi T
13	7/6	Dental implant therapy for the bone defect	Read Chapter 14 and 15 of the textbook before class	Kobayashi T
14	7/13	Transplantation of teeth	Read Chapter 14 and 15 of the textbook before class	Kobayashi T
15	7/20	Morphological and functional assessments	Read Chapter 21 of the textbook before class	Kobayashi T
16	7/27	Oral examination, Case Presentation	Prepare for case presentation of designated case, review past lessons	Kobayashi T

**【Evaluation】**

Evaluated by grades of oral examination (50%) and case presentation (50%)

**【Media】**

白砂兼光・古郷幹彦編著「口腔外科学 第4版」医歯薬出版

**【Reference book】**

日本口腔外科学会 編「イラストでみる口腔外科手術 第1-3巻」クインテッセンス出版

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5652	1	Fri／3・4・I	4	9113	Lecture・Practice
230N5653		Fri／6・7・II			
Course	Dental Radiology Course Work I, II (Oral and maxillofacial diagnostic imaging)				
Instructor	Prof. Takafumi Hayashi (Div. Oral and Maxillofacial Radiology) Ass. Prof. Hideyoshi Nishiyama (Div. Oral and Maxillofacial Radiology)				
Place	Laboratory in Div. Oral and Maxillofacial Radiology				
I・II					
【Course outline】 In the field of dental practice, it is essential to recognize the image features of normal anatomy and functions of the oral cavity. This course provides the basic principles and clinical application of the image analysis of the oral structure and function using various diagnostic imaging techniques.					
【Course aim】 In this course, learners are expected to learn the basic principles of normal morphological and functional status of the oral structures using conventional x-ray, computed tomography (CT), cone-beam CT (CBCT), MR imaging, ultrasonography and positron emission tomography (PET)/CT.					
【Attainment target】 1) To identify the basic principle of intraoral radiography and the normal anatomy. 2) To identify the basic principle of panoramic radiography and the normal anatomy. 3) To identify the basic principle of CT and the normal anatomy of hard tissue. 4) To identify the normal anatomy of soft tissues in oral cavity on CT. 5) To identify the basic principle of CBCT and the normal anatomy. 6) To identify the basic principle of MRI and the normal anatomy. 7) To identify the basic principle of ultrasonography and the normal anatomy. 8) To identify the basic principle of PET/CT and the normal functional status.					
【Study method・attention】 Lecture (1st period) and practical course using various imaging modalities (2nd period). Formative evaluation: pre and posttest. Lecture download website is provided. Real-time online lecture using Zoom would be provided. Computer device and internet access environment are required. Web pages: <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/coursework/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/coursework/</a> <a href="https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/">https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/</a>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/7	Guidance of the course and basic principles of intraoral radiography (online)	Provision of the intraoral radiography		H. Nishiyama
2	4/14	Normal anatomy on intraoral radiography	Provision of the		H. Nishiyama



		(online)	normal anatomy on intraoral radiography	
3	4/21	Basic principles of ultrasonography (online)	Provision of the basic principles of ultrasonography	T. Hayashi
4	4/28	Normal anatomy on ultrasonographic images (online)	Provision of the normal anatomy on ultrasonographic images	T. Hayashi
5	5/12	Basic principles of panoramic radiography (online)	Provision of the panoramic radiography	H. Nishiyama
6	5/19	Normal anatomy on panoramic radiography (online)	Provision of the normal anatomy on panoramic radiography	H. Nishiyama
7	5/26	Basic principles of CT	Provision of the basic principles of CT	T. Hayashi
8	6/2	Normal anatomy of hard tissues on CT images (online)	Provision of the normal anatomy of hard tissues on CT images	T. Hayashi
9	6/9	Normal anatomy of soft tissues on CT images (online)	Provision of the normal anatomy of soft tissues on CT images	T. Hayashi
10	6/16	Basic principles of CBCT (online)	Provision of the basic principles of CBCT	H. Nishiyama
11	6/23	Normal anatomy on CBCT images (online)	Provision of the normal anatomy on CBCT images	H. Nishiyama
12	6/30	Basic principles of MR imaging (online)	Provision of the basic principles of MRI	H. Nishiyama
13	7/7	Normal anatomy on MR images (online)	Provision of the normal anatomy on MR images	H. Nishiyama
14	7/14	Basic principles of PET (online)	Provision of the basic principles of PET	T. Hayashi
15	7/21	Normal functional status of oral cavity on PET images (online)	Provision of the normal functional status of oral cavity on PET images	T. Hayashi
16	7/28	Examination (face-to-face)	Review of the course	T. Hayashi

**【Evaluation】**

Summative evaluation (90%): multiple-choice and open-ended tests. Attitude in the lecture and interest in the field (10%). In-person exam will be held.

**【Media】**

Lecture notes should be downloaded prior to the lecture date.

**【Reference book】**

Hiroya Ojiri. Head and Neck Imaging Fourth Edition. Nankodo. (JPY 19,800 with tax)

**【Related links】**

<https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/coursework/>

<https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/>

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5654	1	Thu/3, 4・I	4	9113	Lecture
230N5655		Thu/6, 7・II			
Course	Basic science course for pain I, II				
Instructor	Prof. Kenji Seo (Div. of Dental Anesthesiology)				
Place	Outward patient clinic and conference room of Dental Anesthesia				
I・II					
<b>【Course outline】</b> This course aims to understand the mechanism of peripheral cause, cognition and modulation of pain. <b>【Course aim】</b> In this course, the students are requested to learn basic science of pain, e.g. cognition and modulation of pain. And they need to know scientific terminology. <b>【Attainment target】</b> After this course, the students are able to ・understand orofacial pain feature ・understand a terminology of pain medicine <b>【Study method・attention】</b> Contents of the preparations for the next class will be informed in the previous class. The students sometimes need to attend on the clinical activity in the outward patient clinics					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/06	Guidance	Refer to the textbook		Kenji Seo
2	4/13	Etiology of pain	Refer to the textbook		Kenji Seo
3	4/20	Anatomy of peripheral nerve	Refer to the textbook		Kenji Seo
4	4/27	Anatomy of pain pathway	Refer to the textbook		Kenji Seo
5	5/11	Cognition of pain	Refer to the textbook		Kenji Seo
6	5/18	Physiology of sensory neuron	Refer to the textbook		Kenji Seo
7	5/25	Physiology of sensory neuron	Refer to the textbook		Kenji Seo
8	6/01	Physiology of sensory neuron	Refer to the textbook		Kenji Seo
9	6/08	Symptoms of pain	Refer to the textbook		Kenji Seo
10	6/15	Pathology of pain	Refer to the textbook		Kenji Seo
11	6/22	Pathology of pain	Refer to the textbook		Kenji Seo
12	6/29	Pathology of pain	Refer to the textbook		Kenji Seo

13	7/06	Descending inhibition of pain	Refer to the textbook	Kenji Seo
14	7/13	Pain modulation	Refer to the textbook	Kenji Seo
15	7/20	Treatment of pain	Refer to the textbook	Kenji Seo
16	7/27	Examination	Refer to the textbook	Kenji Seo
<p><b>【Evaluation】</b>  Students need to pass the oral examination. (statement 50%, discussion 50%)</p> <p><b>【Media】</b>  Orofacial pain (Sessle, Lavigne, Lund, Dubner) second edition, Quintessence publishing  Text book of pain (Wall/Melzack) Churchill Livingstone</p> <p><b>【Reference book】</b>  Some manuscripts are provided during the course.</p>				

Elective Subjects in a Related Discipline  
(Elective Subjects)

# Integrated Lectures on Basic and Clinical Dentistry

## Integrated Lectures on Basic and Clinical Dentistry

Course	Page
Basic and clinical researches on ingestion	77

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5701	2	Wed/5	2	9015	Lecture
Course	Basic and clinical researches on ingestion				
Instructor	Prof. Makoto Inoue (Div. Dysphagia Rehabilitation) Associate Prof. Takanori Tsujimura (Div. Dysphagia Rehabilitation) Lecture r Jin Magara (Dysphagia Rehabilitation Unit of Niigata University Medical and Dental Hospital) Prof. Tetsuya Gotoh (Kagoshima University) Prof. Takafumi Katoh (Osaka University) Prof. Yukio Katori (Tohoku University) Prof. Tomio Inoue (Kyoto Koka Women’s University) Prof. Yuji Masuda (Matsumoto Dental University) Prof. Noriatsu Shigemura (Kyushu University) Prof. Masamichi Shinoda (Nihon University) Associate Prof. Shiro Nakamura (Showa University) Associate Prof. Hitoshi Maezawa				
Place	Meeting room of Faculty of Dentistry				
I • II					
<b>【Course outline】</b> Human need not only teeth but also surrounding muscles and nerves to accomplish normal stomatognathic function. The students are expected to grasp the knowledge of evaluating the functions to diagnose and learn the research update. <b>【Course aim】</b> The course deals with the methodology for evaluation of stomatognathic function including mastication, swallowing, phonation and respiration. <b>【Attainment target】</b> The students will correctly understand anatomy and physiology of related to swallowing function organs. The student will appropriately explain the newest information on the ingestion researches. <b>【Study method・attention】</b> The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	10/4	Introduction	Read handout before lecture	Makoto Inoue	
2	10/11	Swallowing physiology	Read handout before lecture	Makoto Inoue	
3	10/18	Orofacial anatomy and function associated with	Read handout before	Makoto	



		ingestion	lecture	Inoue
4	10/25	Mastication physiology	Read handout before lecture	Tomio Inoue
5	11/1	Surgical approach to dysphagia	Read handout before lecture	Yukio Katori
6	11/8	Role of higher centers in feeding	Read handout before lecture	Makoto Inoue
7	11/15	Neural control during sleep	Read handout before lecture	Takafumi Katoh
8	11/22	Electromyography	Read handout before lecture	Jin Magara
9	11/29	Cough, respiration and swallow	Read handout before lecture	Takanori Tsujimura
10	12/6	Cortical control of chewing	Read handout before lecture	Hitoshi Maezawa
11	12/13	Pain induced modulation of jaw movements	Read handout before lecture	Masanori Shinoda
12	12/20	Neurophysiology of taste sensation	Read handout before lecture	Noriatsu Shigemura
13	1/10	Role of Trigeminal Mesencephalic Nucleus in chewing	Read handout before lecture	Tetsuya Gotoh
14	1/17	Importance of chewing function	Read handout before lecture	Yuji Masuda
15	1/24	Neuropharmacological approach on chewing function	Read handout before lecture	Shiro Nakamura
16	1/31	Examination (possible, on remote)	Read handouts before examination	Makoto Inoue
<p><b>【Evaluation】</b>  Oral examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout supplied by Div. Dysphagia Rehabilitation</p> <p><b>【Reference book】</b>  Recent research papers will be provided every time.</p>				

Department of Oral Health Science

## Department of Oral Health Science

Course	Page
Advanced Seminar of Infectious Diseases IA, IIA, IB, IIB	81
Advanced Seminar of Bacteriology and Immunology IA, IIA, IB, IIB	84
Osteoimmunology IA, IIA, IB, IIB	88
Advanced Course of Tissue Engineering IA, IIA, IB, IIB	91
Tissue Engineering Hands-on Seminar IA, IB, IIA, IIB	94
Advanced Course on Biomaterials IA, IIA, IB, IIB	97
Advanced Seminar on Biomaterials IA, IIA, IB, IIB	100
Endodontics IA, IIA, IB, IIB	104
Seminar on Endodontics IA, IIA, IB, IIB	107
Seminar on cariology IA, IIA, IB, IIB	109
Global Oral Epidemiology IA, IIA, IB, IIB	112
Practical Global Oral Health Science IA, IIA, IB, IIB	116
Seminar on Preventative dentistry IA, IIA, IB, IIB	120
Dentistry for Child Health and Development IA, IIA, IB, IIB	124
Practice of Pediatric Dentistry: Treatment of Children's Oral Disease IA, IIA, IB, IIB	127
Seminar on Special Needs Dentistry IA, IIA, IB, IIB	130
Surgical Approach for Temporomandibular Joint Diseases IA, IIA, IB, IIB	133
Seminar on Molecular diagnosis of the oral cancer IA, IIA, IB, IIB	137
Oral Implantology IA, IIA, IB, IIB	141
Fixed Prosthodontic Treatment IA, IIA, IB, IIB	144
Dental Implant treatment IA, IIA, IB, IIB	147
Basic research seminar of Oral implant dentistry IA, IIA	150
Digital technology in prosthodontics IA, IIA	152
Clinical Dental Implantology IA, IIA, IB, IIB	154
Basic Physiology of Pain IA, IIA, IB, IIB	157
Clinical seminar and practice training for treatment of dental caries based on clinical cariology IA, IIA, IB, IIB	160

Treatment of Cleft Lip and Palate IA, IIA, IB, IIB	164
Seminar on oral health policy IA, IIA, IB, IIB	167
Public health dentistry IA, IIA, IB, IIB	170
Seminar on Statistics of Hygiene and Social Welfare IA, IIA, IB, IIB	174
Seminar on Biomechanics Applied to Prosthodontics IA, IIA, IB, IIB	177
A course for short externship in the foreign dental schools/research institutes	180

### **Course for Global Oral Health Science**

Extramural Externship	182
Dissertation Interim Presentation	184
Dissertation Presentation of Global Oral Health Science at International Congress	186
Dissertation Proposal Development and Implementation for Global Oral Health Science	188
Dissertation defense	190

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5101	1	Tue/6 :IA	2	9014	Lecture・Seminar
230N5103		Tue/6 :IIA			
230N5102	2	Tue/6 :IB	2	9015	Lecture・Seminar
230N5104		Tue/6 :IIB			
Course	Advanced Seminar of Infectious Diseases IA, IIA, IB, IIB				
Instructor	Prof. Yutaka Terao (Division of Microbiology and Infectious Diseases)				
Place	Room E418				
IA・IIA					
<p>【Course outline】</p> <p>I will review and lecture the basic methodology and techniques about microbiological and immunological researches among <i>in silico</i> and <i>in vitro</i>. In addition, this course includes various basic practices on molecular biological assays.</p> <p>【Course aim】</p> <p>The aim of this course is to learn the concepts and methods of various basic experiments of life science and infectious researches.</p> <p>【Attainment target】</p> <p>(1) Describe the basic techniques on molecular microbiology.</p> <p>(2) Describe the basic techniques and the related lows of about recombinant DNA experiments.</p> <p>(3) Practice the basic methodology concerning with bioinformatics</p> <p>【Study method・attention】</p> <p>In the first step, participants should learn the basic knowledge, and then participants will be judged by a written examination. After passing, participants will proceed with the basic experimental seminar. There will be a modest amount of materials assigned for class preparation and self-study at each seminar.</p>					
【Plan】					
No.	Date	Contents	Preparation and Review		Instructor
1	4/11	Overview (IA/IIA)	Organize the main points		Yutaka Terao
2	4/18	Basic Bacteriology 1 (IA/IIA)	Organize the main points		Yutaka Terao
3	4/25	Basic Bacteriology 2 (IA/IIA)	Organize the main points		Yutaka Terao
4	5/2	Basic Bacteriology 3 (IA/IIA)	Organize the main points		Yutaka Terao
5	5/9	Basic Bacteriology 4 (IA/IIA)	Organize the main points		Yutaka Terao
6	5/16	Basic Molecular Biology 1 (IA/IIA)	Organize the main points		Yutaka Terao
7	5/23	Basic Molecular Biology 2 (IA/IIA)	Organize the main points		Yutaka Terao
8	5/30	Basic Cell Biology 1 (IA/IIA)	Organize the main points		Yutaka Terao
9	6/6	Basic Cell Biology 2 (IA/IIA)	Organize the main points		Yutaka Terao

10	6/13	Basic Immunology 1 (IA/IIA)	Organize the main points	Yutaka Terao
11	6/20	Basic Immunology 2 (IA/IIA)	Organize the main points	Yutaka Terao
12	6/27	Basic Immunology 3 (IA/IIA)	Organize the main points	Yutaka Terao
13	7/4	Basic Immunology 4 (IA/IIA)	Organize the main points	Yutaka Terao
14	7/11	Discussion	Keyword organization	Yutaka Terao
15	7/18	Conclusion	Review until the previous class	Yutaka Terao
16	7/25	Examination (IA/IIA)	Exam question review	Yutaka Terao

#### 【Evaluation】

Written Examination 50%

Discussion and Debate 50%

#### 【Media】

**Molecular Cloning:** A Laboratory Manual, 4<sup>th</sup> edition 3 volume set. Michael R Green and Joseph Sambrook. Cold Spring Harbor Laboratory Press. ISBN-13: 978-1605500560 / ISBN-10: 1936113422. (Paperback \$365.00)

#### 【Reference book】

The research paper using in the lecture will be distributed in each practice.

### IB・IIB

#### 【Course outline】

I will review and lecture the advanced methodology and techniques about microbiological and immunological researches among *in silico* and *in vitro*. In addition, this course includes various advanced practices on molecular biological assays.

#### 【Course aim】

The aim of this course is to learn the concepts and methods of various advanced current experiments of life science and infectious researches.

#### 【Attainment target】

- (1) Describe the advanced techniques on molecular microbiology.
- (2) Describe the advanced techniques and the related laws of about recombinant DNA experiments.
- (3) Practice the advanced methodology concerning with bioinformatics

#### 【Study method・attention】

In the first step, participants should learn the advanced knowledge, and then participants will be judged by a written examination. After passing, participants will proceed with the advanced experimental seminar. There will be a modest amount of materials assigned for class preparation and self-study at each seminar.

#### 【Plan】

No.	Date	Contents	Preparation and Review	Instructor
1	10/3	Overview (IB/IIB)	Organize the main points	Yutaka Terao
2	10/10	Advanced Bacteriological Practice 1 (IB/IIB)	Organize the main points	Yutaka Terao
3	10/17	Advanced Bacteriological Practice 2 (IB/IIB)	Organize the main points	Yutaka Terao
4	10/24	Advanced Bacteriological Practice 3 (IB/IIB)	Organize the main points	Yutaka Terao

5	10/31	Advanced Bacteriological Practice 4 (IB/IIB)	Organize the main points	Yutaka Terao
6	11/7	Advanced Molecular Practice 1 (IB/IIB)	Organize the main points	Yutaka Terao
7	11/14	Advanced Molecular Practice 2 (IB/IIB)	Organize the main points	Yutaka Terao
8	11/21	Advanced Cell Biology 1 (IA/IIB)	Organize the main points	Yutaka Terao
9	11/28	Advanced Cell Biology 2 (IA/IIB)	Organize the main points	Yutaka Terao
10	12/5	Advanced Immunological Practice 1 (IB/IIB)	Organize the main points	Yutaka Terao
11	12/12	Advanced Immunological Practice 2 (IB/IIB)	Organize the main points	Yutaka Terao
12	12/19	Advanced Immunological Practice 3 (IB/IIB)	Organize the main points	Yutaka Terao
13	12/26	Advanced Immunological Practice 4 (IB/IIB)	Organize the main points	Yutaka Terao
14	1/16	Discussion	Keyword organization	Yutaka Terao
15	1/23	Conclusion	Review until the previous class	Yutaka Terao
16	1/30	Examination (IB/IIB)	Exam question review	Yutaka Terao

**【Evaluation】**

Written Examination 50%

Discussion and Debate 50%

**【Media】**

**Molecular Cloning:** A Laboratory Manual, 4<sup>th</sup> edition 3 volume set. Michael R Green and Joseph Sambrook. Cold Spring Harbor Laboratory Press. ISBN-13: 978-1605500560 / ISBN-10: 1936113422. (Hardcover \$375.25, Paperback \$322.76)

**【Reference book】**

The research paper using in the lecture will be distributed in each practice.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5105	1	Fri/6 :IA	2	9014	Lecture・Seminar
230N5107		Fri/6 :IIA			
230N5106	2	Fri/6 :IB	2	9015	Lecture・Seminar
230N5108		Fri/6 :IIB			
Course	Advanced Seminar of Bacteriology and Immunology IA, IIA, IB, IIB				
Instructor	Associate Prof. Hisanori Domon (Division of Microbiology and Infectious Diseases)				
Place	Room E418				
IA・IIA					
<b>【Course outline】</b> I will review on the basic researches in microbiology and immunology. In addition, this course includes the lecture about the techniques of basic molecular and cellular biological research.					
<b>【Course aim】</b> The aim of this course is to learn the basic techniques about microbiology and immunology.					
<b>【Attainment target】</b> (1) Describe the basic techniques about microbiology. (2) Describe the basic techniques about molecular and cellular biology. (3) Practice the basic techniques about immunology.					
<b>【Study method・attention】</b> The basic knowledge of microbiology, molecular cellular biology, and immunology will be provided by lecture. And then, participants will be evaluated by a written examination. After passing, participants will proceed with the experimental practice. There will be a modest amount of materials assigned for class preparation and self-study at each practice.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	4/7	Overview (IA/IIA)	Organize the main points		Hisanori Domon
2	4/14	Basic Bacteriology 1	Organize the main points		Hisanori Domon
3	4/21	Basic Bacteriology 2	Organize the main points		Hisanori Domon
4	4/28	Basic Bacteriology 3	Organize the main points		Hisanori Domon
5	5/12	Basic Oral Bacteriology 1	Organize the main points		Hisanori Domon
6	5/19	Basic Oral Bacteriology 2	Organize the main points		Hisanori Domon



7	5/26	Basic Oral Bacteriology 3	Organize the main points	Hisanori Domon
8	6/2	Basic Molecular Biology 1	Organize the main points	Hisanori Domon
9	6/9	Basic Molecular Biology 2	Organize the main points	Hisanori Domon
10	6/16	Basic Molecular Biology 3	Organize the main points	Hisanori Domon
11	6/23	Basic Molecular Biology 4	Organize the main points	Hisanori Domon
12	6/30	Basic Immunology 1	Organize the main points	Hisanori Domon
13	7/7	Basic Immunology 2	Organize the main points	Hisanori Domon
14	7/14	Basic Immunology 3	Organize the main points	Hisanori Domon
15	7/21	Conclusion and Oral Examination	Keyword organization	Hisanori Domon
16	7/28	Examination (IA/IIA)	Exam question review	Hisanori Domon

#### 【Evaluation】

Oral Examination 15%

Technical Examination 15%

Written Examination 30%

Discussion and debate 40%

#### 【Media】

(1) Current Protocols Essential Laboratory Techniques, Sean R. Gallagher and Emily A. Wiley (Wiley-Blackwell)

(2) Molecular Cloning Fourth Edition, Michael R. Green and Joseph Sambrook (Cold Spring Harbor Laboratory Press)

#### 【Reference book】

The research paper using in the lecture will be distributed in each practice.

### IB・IIB コース

#### 【Course outline】

I will review on the advanced researches in microbiology and immunology. In addition, this course includes the lecture about the techniques of advanced molecular and cellular biological research.

#### 【Course aim】

The aim of this course is to learn the advanced techniques about microbiology and immunology.

#### 【Attainment target】

(1) Describe the advanced techniques about microbiology.

(2) Describe the advanced techniques about molecular and cellular biology.

(3) Practice the advanced techniques about immunology.

**【Study method・attention】**

In every class, the advanced knowledge of microbiology, molecular cellular biology, and immunology will be provided by lecture. And then, participants will be evaluated by a written examination. After passing, participants will proceed with the experimental practice. There will be a modest amount of materials assigned for class preparation and self-study at each practice.

**【Plan】**

No.	Date	Contents	Preparation and Review	Instructor
1	10/6	Overview (IB/IIB)	Organize the main points	Hisanori Domon
2	10/13	Advanced Bacteriological Practice 1	Organize the main points	Hisanori Domon
3	10/20	Advanced Bacteriological Practice 2	Organize the main points	Hisanori Domon
4	10/27	Advanced Bacteriological Practice 3	Organize the main points	Hisanori Domon
5	11/10	Advanced Oral Bacteriological Practice 1	Organize the main points	Hisanori Domon
6	11/17	Advanced Oral Bacteriological Practice 2	Organize the main points	Hisanori Domon
7	11/24	Advanced Oral Bacteriological Practice 3	Organize the main points	Hisanori Domon
8	12/1	Advanced Molecular Practice 1	Organize the main points	Hisanori Domon
9	12/8	Advanced Molecular Practice 2	Organize the main points	Hisanori Domon
10	12/15	Advanced Molecular Practice 3	Organize the main points	Hisanori Domon
11	12/22	Advanced Immunological Practice 1	Organize the main points	Hisanori Domon
12	1/12	Advanced Immunological Practice 2	Organize the main points	Hisanori Domon
13	1/19	Advanced Immunological Practice 3	Organize the main points	Hisanori Domon
14	1/26	Discussion and Oral Examination	Keyword organization	Hisanori Domon
15	2/2	Conclusion	Review until the previous	Hisanori

			class	Domon
16	2/9	Examination (IB/IIB)	Exam question review	Hisanori Domon
<p><b>【Evaluation】</b></p> <p>Oral Examination 15%</p> <p>Technical Examination 15%</p> <p>Written Examination 30%</p> <p>Discussion and debate 40%</p> <p><b>【Media】</b></p> <p>(1) Current Protocols Essential Laboratory Techniques, Sean R. Gallagher and Emily A. Wiley (Wiley-Blackwell)</p> <p>(2) Molecular Cloning Fourth Edition, Michael R. Green and Joseph Sambrook (Cold Spring Harbor Laboratory Press)</p> <p><b>【Reference book】</b></p> <p>The research paper using in the lecture will be distributed in each practice.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5109	1	Wed/3・IA	2	9014	Lecture
230N5111		Wed/4・IIA			
230N5110	2	Wed/3・IB	2	9015	Lecture
230N5112		Wed/4・IIB			
Course	Osteoimmunology IA, IIA, IB, IIB				
Instructor	Associate Prof. Tomoki Maekawa Assistant Prof. Rosenkranz Andrea Lynn				
Place	Room C605–Center for Advanced Oral Science				
IA・IIA					
<b>【Course outline】</b> Lectures and experiments will be conducted on the connection between the cells that construct the bones and the immune cells from the viewpoint of basic medicine not only in the oral cavity but also in arthritis or hematopoiesis and cancer. <b>【Course aim】</b> By explaining osteoimmunology, in which links bone-metabolism and immunology, the students will be able to understand that whole body metabolisms are linked by closed coordination of organisms. <b>【Attainment target】</b> (1) Students will explain the origin and functions of immune cells. (2) Students will explain bone function and metabolism. (3) Students will explain the theory of osteoimmunology. <b>【Study method・attention】</b> Pre-learning of technical terms is recommended by pre-distributed prints. Classes are conducted in a lecture format using English.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Guidance & introduction	Related papers		Maekawa Rosenkranz
2	4/19	RANKL, a cytokine that links bone and the immune system	Related papers		Maekawa
3	4/26	Molecular mechanism of osteoclast differentiation	Related papers		Maekawa
4	5/10	Bone destruction and Th17 cells in rheumatoid arthritis	Related papers		Maekawa Rosenkranz
5	5/17	Inflammatory cytokines and bone destruction	Related papers		Maekawa
6	5/24	Joint destruction and osteoclasts	Related papers		Maekawa

7	5/31	Bone environment and cancer cells	Related papers	Maekawa Rosenkranz
8	6/7	Bone marrow niche and hematopoiesis	Related papers	Maekawa
9	6/14	Hematopoietic stem cell regulation by osteoclasts	Related papers	Maekawa
10	6/21	Vitamin D and the immune system	Related papers	Maekawa
11, 12	6/28 7/5	Inflammatory cytokine signaling pathway 1,2	Related papers	Maekawa Rosenkranz
13	7/12	Molecular mechanism of osteoblast	Related papers	Maekawa
14, 15	7/19 7/26	Cross talk between bone and immune system 1,2	Related papers	Maekawa Rosenkranz
16	8/2	Conclusion, Discussion, and Examination	Related papers	Maekawa Rosenkranz

#### 【Evaluation】

Written Examination 50%, Discussion and debate 30%, class attitude 20%. In-person examination

#### 【Media】

Osteoimmunology (Ishiyaku Publisher Co.) 4,400 Yen (+tax)

Joneway's immunobiology (Nankodo Co.) 8,715 Yen (+tax)

Osteoimmunology for dental student (Ishiyaku Publisher Co.) 6,600 Yen (+tax)

#### 【Reference book】

Related scientific papers will be provided prior to lecture.

#### IB・IIB

#### 【Course outline】

Lectures on osteoimmunology and perform experiments on the pathogenesis in the treatment of osteoimmunology-related diseases.

#### 【Course aim】

Understand the relationship between periodontal disease, rheumatoid arthritis, blood diseases and osteoimmunology.

#### 【Attainment target】

(1) Students will the function of immune cells.

(2) Students will bone metabolism-related diseases.

(3) Students will the theory of osteoimmunology.

#### 【Study method・attention】

Pre-learning of technical terms is recommended by pre-distributed prints.

Classes are conducted in a lecture format using English.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance & introduction	Related papers	Maekawa Rosenkranz

2	10/11	Bone destruction and Th17 cells in rheumatoid arthritis	Related papers	Maekawa
3, 4	10/18 10/25	Treatment strategies for inflammatory bone destruction. 1,2	Related papers	Maekawa Rosenkranz
5, 6	11/1 11/8	Osteoimmunology and inflammatory cytokines 1,2	Related papers	Maekawa Rosenkranz
7	11/15	DAP12 and bone disease	Related papers	Maekawa
8	11/22	ITAM signal and osteoclast differentiation	Related papers	Maekawa
9	11/29	Dendritic cells and RANK signal	Related papers	Maekawa Rosenkranz
10	12/6	Thymic medullary epithelial cells and RANK signals	Related papers	Maekawa
11	12/13	Dendritic cells and OPG signal	Related papers	Maekawa
12	12/20	RNAK and OPG signaling	Related papers	Maekawa
13	1/10	Molecular mechanism of bone marrow GVHD	Related papers	Maekawa
14	1/17	Molecular mechanism of osteoclast differentiation	Related papers	Maekawa
15	1/24	Distant metastasis of cancer	Related papers	Maekawa
16	1/31	Conclusion, Discussion, and Examination	Related papers	Maekawa Rosenkranz
<p><b>【Evaluation】</b> Written Examination 50%, Discussion and debate 30%, class attitude 20%. In-person examination</p> <p><b>【Media】</b> Osteoimmunology (Ishiyaku Publisher Co.) 4,400 Yen (+tax) Joneway's immunobiology (Nankodo Co.) 8,715 Yen (+tax) Osteoimmunology for dental student (Ishiyaku Publisher Co.) 6,600 Yen (+tax)</p> <p><b>【Reference book】</b> Pre-learning of technical terms is recommended by pre-distributed prints.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5113	1	Tue/1・IA	2	9014	Lecture
230N5115		Tue/6・IIA			
230N5114	2	Tue/1・IB	2	9015	Lecture
230N5116		Tue/6・IIB			
Course	Advanced Course of Tissue Engineering IA, IIA, IB, IIB				
Instructor	Prof. Kenji IZUMI (Div. Biomimetics)				
Place	C building seminar room (C412)				
IA・IIA					
<b>【Course outline】</b> Outline of the triad of tissue engineering including stem cell biology is lectured. Time and/or vascularization, as an additional factor(s) of tissue engineering are also explained.					
<b>【Course aim】</b> This course aims to study basic idea/strategy of tissue engineering utilized for cell therapy as well as the updates and trends in regenerative medicine. In addition, recent topics on iPS cells are described.					
<b>【Attainment target】</b> Students will be able to realize characteristics of cells suitable for use in tissue engineering understand significance of time and vascularization in tissue engineering/regenerative medicine understand stem cell biology explain a variety of properties of scaffolds/biomaterials used for tissue engineering get roles and functions of growth factors supplemented in the culture medium describe critical factors to determine the fate of cell/tissue based products after transplantation learn utility values of iPS cells. discuss major challenges of regenerative medicine.					
<b>【Study method・attention】</b> ・This class is basically lecture-style, and sometimes a journal-club presentation style is held. ・Lecture materials are provided prior to the class. ・Attending neither A nor B class is allowed.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/11	Introduction	The details are instructed in the class.	Kenji Izumi	
2-4	4/18 4/25 5/2	Regarding cells to be used in tissue engineering	The details are instructed in the class.	Kenji Izumi	

5, 6	5/9 5/16	Regarding somatic stem cell, especially iPS cell	The details are instructed in the class.	Kenji Izumi
7-9	5/23 5/30 6/6	Regarding scaffolds and biomaterials	The details are instructed in the class.	Kenji Izumi
10-12	6/13 6/20 6/27	Regarding growth factors (cytokines)	The details are instructed in the class.	Kenji Izumi
13, 14	7/4 7/11	Regarding vascularization occurring in host tissue after transplantation	The details are instructed in the class.	Kenji Izumi
15	7/18	Summary	Reviewing all previous lectures	Kenji Izumi
16	7/25	Examination	Reviewing all previous lectures	Kenji Izumi

#### 【Evaluation】

The grade is evaluated by face-to-face oral and written examination (50% each)

#### 【Media】

歯科再生医学【医歯薬出版株式会社】JPY 15,000

#### 【Reference book】

I will provide research papers if required.

#### IB・IIB

#### 【Course outline】

Outline of the triad of tissue engineering including stem cell biology is lectured. Time and/or vascularization, as an additional factor(s) of tissue engineering are also explained.

#### 【Course aim】

This course aims to study basic idea/strategy of tissue engineering utilized for cell therapy as well as the updates and trends in regenerative medicine. In addition, recent topics on iPS cells are described.

#### 【Attainment target】

Students will be able to  
 realize characteristics of cells suitable for use in tissue engineering  
 understand significance of time and vascularization in tissue engineering/regenerative medicine  
 understand stem cell biology  
 explain a variety of properties of scaffolds/biomaterials used for tissue engineering  
 get roles and functions of growth factors supplemented in the culture medium  
 describe critical factors to determine the fate of cell/tissue based products after transplantation  
 learn utility values of iPS cells.  
 discuss major challenges of regenerative medicine.

#### 【Study method・attention】

- This class is basically lecture-style, and sometimes a journal-club presentation style is held.



<ul style="list-style-type: none"> <li>•Lecture materials are provided prior to the class.</li> <li>•Attending neither A nor B class is allowed.</li> </ul>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Introduction	The details are instructed in the class.	Kenji Izumi
2-4	10/10 10/17 10/24	Regarding cells to be used in tissue engineering	The details are instructed in the class.	Kenji Izumi
5, 6	10/31 11/7	Regarding somatic stem cell, especially iPS cell	The details are instructed in the class.	Kenji Izumi
7-9	11/14 11/21 11/28	Regarding scaffolds and biomaterials	The details are instructed in the class.	Kenji Izumi
10-12	12/5 12/12 12/19	Regarding growth factors (cytokines)	The details are instructed in the class.	Kenji Izumi
13, 14	12/26 1/16	Regarding vascularization occurring in host tissue after transplantation	The details are instructed in the class.	Kenji Izumi
15	1/23	Summary	Reviewing all previous lectures	Kenji Izumi
16	1/30	Examination	Reviewing all previous lectures	Kenji Izumi
<b>【Evaluation】</b> The grade is evaluated by face-to-face oral and written examination (50% each) <b>【Media】</b> 歯科再生医学【医歯薬出版株式会社】JPY 15,000 <b>【Reference book】</b> I will provide research papers if required.				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5117	1	Wed/1・IA	2	9014	Lecture・Practice
230N5119		Wed/6・IIA			
230N5118	2	Wed/1・IB	2	9015	Lecture・Practice
230N5120		Wed/6・IIB			
Course	Tissue Engineering Hands-on Seminar IA, IB, IIA, IIB				
Instructor	Prof. Kenji IZUMI (Div. Biomimetics)				
Place	A204 Alliance etc.				
IA・IIA					
<p>【Course outline】</p> <p>Standard cell analyses applied to tissue engineering are conducted in this wet lab.</p> <p>【Course aim】</p> <p>The students will acquire several standard techniques to examine characteristics of cells in vitro using equipment such as a microplate reader, flow cytometer and confocal laser microscope.</p> <p>【Attainment target】</p> <p>The students will be able to</p> <ul style="list-style-type: none"><li>• analyze characteristics of cells depending on specific aim of different researches.</li><li>• understand the principles of flow cytometer and learn how to operate the equipment.</li><li>• perform confocal laser microscopic analysis.</li><li>• describe the relationship between image analysis and biophysical examinations.</li></ul> <p>【Study method・attention】</p> <ul style="list-style-type: none"><li>• This class provides hands-on experience.</li><li>• Study materials are provided prior to the class.</li><li>• Attending neither A nor B class is allowed.</li></ul>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Introduction	The details are instructed in the class.		Kenji Izumi
2, 3	4/19 4/26	Instruction manual of equipment	The details are instructed in the class.		Kenji Izumi
4-6	5/10 5/17 5/24	Analyses using a microplate reader	The details are instructed in the class.		Kenji Izumi
7-11	5/31 6/7	Principles and operation system of flow cytometer	The details are instructed in the		Kenji Izumi

	6/14 6/21 6/28		class.	
12-14	7/5 7/12 7/19	Regarding confocal laser microscope	The details are instructed in the class.	Kenji Izumi
15	7/26	Presentation Summary	Each student presents and reports his/her own experiments etc.	Kenji Izumi
16	8/2	Examination	Reviewing all of the contents	Kenji Izumi

#### 【Evaluation】

The grade is evaluated by face-to-face examination (50%) and presentation (50%).

#### 【Media】

A copy of FACS manual is provided.

#### 【Reference book】

I provide appropriate research papers if required.

#### IB・IIB

#### 【Course outline】

Popular cell analyses applied to tissue engineering are conducted in this wet lab.

In addition, biophysical examinations using image analysis are introduced.

#### 【Course aim】

The students will acquire several standard techniques to examine characteristics of cells in vitro using equipment such as a microplate reader, flow cytometer and confocal laser microscope. Furthermore, students will understand the principles of biophysical examinations using image analysis.

#### 【Attainment target】

The students will be able to

- analyze characteristics of cells depending on specific aim of different researches.
- understand the principles of flow cytometer and learn how to operate the equipment.
- perform confocal laser microscopic analysis.
- describe the relationship between image analysis and biophysical examinations.

#### 【Study method・attention】

- This class provides hands-on experience.
- Study materials are provided prior to the class.
- Attending neither A nor B class is allowed.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Introduction	The details are instructed in the class.	Kenji Izumi

2, 3	10/11 10/18	Instruction manual of equipment	The details are instructed in the class.	Kenji Izumi
4-6	10/25 11/1 11/8	Analyses using a microplate reader	The details are instructed in the class.	Kenji Izumi
7-11	11/15 11/22 11/29 12/6 12/13	Principles and operation system of flow cytometer	The details are instructed in the class.	Kenji Izumi
12-14	12/20 1/10 1/17	Regarding confocal laser microscope	The details are instructed in the class.	Kenji Izumi
15	1/24	Presentation Summary	Each student presents and reports his/her own experiments etc.	Kenji Izumi
16	1/31	Examination	Reviewing all of the contents	Kenji Izumi
<p><b>【Evaluation】</b> The grade is evaluated by face-to-face examination (50%) and presentation (50%).</p> <p><b>【Media】</b> A copy of FACS manual is provided.</p> <p><b>【Reference book】</b> I provide appropriate research papers if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5121	1	Thu/1・IA	2	9014	Lecture
230N5123		Thu/6・IIA			
230N5122	2	Thu/1・IB	2	9015	Lecture
230N5124		Thu/6・IIB			
Course	Advanced Course on Biomaterials IA, IIA, IB, IIB				
Instructor	Lecturer Mitsugu KANATANI (Div. Biomimetics)				
Place	Seminar room C412 etc.				
IA・IIA					
<b>【Course outline】</b> Concentrating on titanium, this course discusses electro-chemical properties, corrosion resistance for medical use, and their in vivo reactions.					
<b>【Course aim】</b> Titanium is known as a good biocompatibility material. In this course, students are required to understand and discuss its unique properties from multiple standpoints.					
<b>【Attainment target】</b> After successfully completing this course, students will be able to • explain the basic properties of metallic materials as biomaterials. • explain metallic materials and their in vivo reactions. • explain titanium mining processes. • explain characteristics of titanium and its alloys. • discuss corrosion resistance of titanium and its alloys.					
<b>【Study method・attention】</b> • Lecture materials are provided prior to the class. • This course is composed of lectures and discussion. • Students need to discuss problems and assignments.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/ 6	Introduction	The details are instructed in the class.		Mitsugu Kanatani
2-4	4/13 4/20 4/27	Metallic materials for medical use 1-3	The details are instructed in the class.		Mitsugu Kanatani
5-7	5/11 5/18 5/25	Titanium from mining to biomaterials 1-3	The details are instructed in the class.		Mitsugu Kanatani

8-11	6/ 1 6/ 8 6/15 6/22	Characteristics of titanium and its alloys 1-3	The details are instructed in the class.	Mitsugu Kanatani
12-14	6/29 7/ 6 7/13	Corrosion resistance of titanium and its alloys 1-3	The details are instructed in the class.	Mitsugu Kanatani
15	7/20	Summary	Reviewing all previous lectures.	Mitsugu Kanatani
16	7/27	Examination	Reviewing all previous lectures.	Mitsugu Kanatani

#### 【Evaluation】

The grade is evaluated by oral and written examination (50% each).

#### 【Media】

We will indicate text books if required.

#### 【Reference book】

We provide research papers if required.

### IB・IIB

#### 【Course outline】

Concentrating on titanium, this course discusses electro-chemical properties, corrosion resistance, biocompatibility of metals for medical use, and their in vivo reactions. Moreover, various surface modifications methods to improve biocompatibility is instructed.

#### 【Course aim】

Titanium is known as a good biocompatibility material. In this course, students are required to understand and discuss its unique properties from multiple standpoints, and to further discuss the surface modifications to improve biocompatibility.

#### 【Attainment target】

After successfully completing this course, students will be able to

- explain the basic properties of metallic materials as biomaterials.
- explain metallic materials and their in vivo reactions.
- explain titanium mining processes.
- explain characteristics of titanium and its alloys.
- discuss corrosion resistance of titanium and its alloys.
- discuss biocompatibility and surface properties.
- explain the methods for surface modifications and their in vivo reactions.

#### 【Study method・attention】

- Lecture materials are provided prior to the class.
- This course is composed of lectures and discussion.
- Students need to discuss problems and assignments.

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/ 5	Introduction	The details are instructed in the class.	Mitsugu Kanatani
2	10/12	Metals as biomaterials	The details are instructed in the class.	Mitsugu Kanatani
3	10/19	Metallic materials for medical use	The details are instructed in the class.	Mitsugu Kanatani
4	10/26	Titanium from mining to biomaterials	The details are instructed in the class.	Mitsugu Kanatani
5	11/ 2	Characteristics of titanium and its alloys	The details are instructed in the class.	Mitsugu Kanatani
6	11/ 9	Corrosion resistance of titanium and its alloys	The details are instructed in the class.	Mitsugu Kanatani
7-10	11/16 11/30 12/ 7 12/14	Titanium surface properties and biocompatibility 1-4	The details are instructed in the class.	Mitsugu Kanatani
11-14	12/21 1/11 1/18 1/25	Titanium surface modifications 1-4	The details are instructed in the class.	Mitsugu Kanatani
15	2/ 1	Summary	Reviewing all previous lectures.	Mitsugu Kanatani
16	2/ 8	Examination	Reviewing all previous lectures.	Mitsugu Kanatani
<p><b>【Evaluation】</b> The grade is evaluated by oral and written examination (50% each).</p> <p><b>【Media】</b> We will indicate text books if required.</p> <p><b>【Reference book】</b> We provide research papers if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5125	1	Fri/4・IA	2	9014	Lecture・Practice
230N5127		Fri/6・IIA			
230N5126	2	Fri/4・IB	2	9015	Lecture・Practice
230N5128		Fri/6・IIB			
Course	Advanced Seminar on Biomaterials IA, IIA, IB, IIB				
Instructor	Lecturer Mitsugu KANATANI (Div. Biomimetics)				
Place	Laboratory room at Div. Biomimetics etc.				
IA・IIA					
<p>【Course outline】</p> <p>This course includes lectures and hands-on seminar of fundamental techniques to perform a research on biomaterials. In particular, we measure surface roughness measurement and hardness test in this hands-on seminar.</p> <p>【Course aim】</p> <p>In this course, students learn how we prepare specimens for surface roughness measurement and hardness test. Furthermore, students obtain basic analytical techniques such as several surface roughness measurement as well as hardness tests to perform the research on biomaterials.</p> <p>【Attainment target】</p> <p>After successfully completing this course, students will be able to</p> <ul style="list-style-type: none"><li>• embed the CAD/CAM samples and prepare any appropriate surface by using a polishing machine.</li><li>• prepare the specimens for surface roughness measurement.</li><li>• explain the basic principle of the surface roughness measurement.</li><li>• determine the values of surface roughness from data on the surface roughness measurement.</li><li>• prepare the specimens for hardness test.</li><li>• explain the basic principle of the hardness test.</li><li>• measure the hardness of several biomaterials.</li></ul> <p>【Study method・attention】</p> <ul style="list-style-type: none"><li>• Lecture notes will be provided.</li><li>• Students need to discuss problems and assignments.</li></ul>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/ 7	Introduction	The details are instructed in the class.		Mitsugu Kanatani
2	4/14	Preparation of CAD/CAM specimens	The details are instructed in the class.		Mitsugu Kanatani
3	4/21	Embedding CAD/CAM specimens	The details are instructed in the class.		Mitsugu Kanatani



			class.	
4	4/28	Polishing the embedded specimens	The details are instructed in the class.	Mitsugu Kanatani
5, 6	5/12 5/19	Principles of surface roughness measurement 1, 2	The details are instructed in the class.	Mitsugu Kanatani
7-9	5/26 6/ 2 6/ 9	Measuring surface roughness 1-3	The details are instructed in the class.	Mitsugu Kanatani
10, 11	6/16 6/23	Principles of hardness test 1, 2	The details are instructed in the class.	Mitsugu Kanatani
12-14	6/30 7/ 7 7/14	Performing hardness test 1-3	The details are instructed in the class.	Mitsugu Kanatani
15	7/21	Presentation Summary	Each student presents and reports his/her own experiments etc.	Mitsugu Kanatani
16	7/28	Examination	Reviewing all of the contents	Mitsugu Kanatani
<p><b>【Evaluation】</b> The grade is evaluated by examination (50%) and presentation (50%).</p> <p><b>【Media】</b> We will indicate text books if required.</p> <p><b>【Reference book】</b> We provide research papers if required.</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course includes lectures and hands-on seminar of fundamental techniques to perform a research on biomaterials. In this hands-on seminar, particularly, elemental distribution analysis of biomaterials by Electron probe microanalysis (EPMA) and crystal analysis by X-ray diffraction technique (XRD) are conducted.</p> <p><b>【Course aim】</b> In this course, the students learn how we prepare specimens for electron probe microanalysis (EPMA) etc. Furthermore, in this course, students obtain basic analytical techniques such as elemental analysis and crystal analysis to perform the research on biomaterials.</p> <p><b>【Attainment target】</b> After successfully completing this course, students will be able to</p> <ul style="list-style-type: none"> <li>• embed the metal specimens and prepare any appropriate surface by using a polishing machine.</li> <li>• prepare the specimens for EPMA analysis.</li> <li>• explain the principle of the EPMA analysis.</li> </ul>				

<ul style="list-style-type: none"> <li>• estimate the elemental composition of atoms from the EPMA qualitative spectrum analysis.</li> <li>• estimate the element distribution from the EPMA mapping analysis.</li> <li>• prepare the specimens for XRD analysis.</li> <li>• explain the principle of the XRD analysis.</li> <li>• recognize the crystal structure from the XRD diffraction chart.</li> <li>• identify the presence of compounds from the XRD results.</li> </ul> <p><b>【Study method・attention】</b></p> <ul style="list-style-type: none"> <li>• Lecture notes will be provided.</li> <li>• Students need to discuss problems and assignments.</li> </ul>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/ 6	Introduction	The details are instructed in the class.	Mitsugu Kanatani
2	10/13	Preparing casting mold	The details are instructed in the class.	Mitsugu Kanatani
3	10/20	Cast of dental alloys	The details are instructed in the class.	Mitsugu Kanatani
4	10/27	Embedding alloy specimens	The details are instructed in the class.	Mitsugu Kanatani
5	11/10	Polishing the embedded specimens	The details are instructed in the class.	Mitsugu Kanatani
6, 7	11/17 11/24	Principles of EPMA analysis 1, 2	The details are instructed in the class.	Mitsugu Kanatani
8-10	12/ 1 12/ 8 12/15	Elemental analysis by EPMA 1-3	The details are instructed in the class.	Mitsugu Kanatani
11, 12	12/22 1/12	Principles of XRD analysis 1, 2	The details are instructed in the class.	Mitsugu Kanatani
13, 14	1/19 1/26	Crystal analysis by XRD 1, 2	The details are instructed in the class.	Mitsugu Kanatani
15	2/ 2	Presentation Summary	Each student presents and reports his/her own experiments etc.	Mitsugu Kanatani
16	2/ 9	Examination	Reviewing all of the contents	Mitsugu Kanatani
<p><b>【Evaluation】</b></p> <p>The grade is evaluated by examination (50%) and presentation (50%).</p>				

**【Media】**

We will indicate text books if required.

**【Reference book】**

We provide research papers if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5129	1	Fri/6・ⅠA	2	9114	Lectures, demonstrations, and laboratory practices
230N5131		Fri/7・ⅡA			
230N5130	2	Fri/6・ⅠB	2	9115	Lectures, demonstrations, and laboratory practices
230N5132		Fri/7・ⅡB			
Course	Endodontics ⅠA, ⅡA, ⅠB, ⅡB				
Instructor	Prof. Yuichiro Noiri (Div. of Cariology, Operative Dentistry & Endodontics) Prof. Hidefumi Maeda				
Place	Laboratory in Div. Cariology, Operative Dentistry & Endodontics				
ⅠA・ⅡA					
【Course outline】 A: This course will offer current information on (i) biological processes involved in pulpal and apical periodontal diseases, and (ii) principles and clinical strategies in endodontic treatment. 【Course aim】 A: To understand (i) pathobiology of pulpal and apical periodontal diseases, and (ii) principles and clinical strategies in endodontic treatment. 【Attainment target】 A: After completing this course, the student should be able to: 1.Describe the pathogenesis of pulpal diseases. 2.Describe principles and techniques of vital pulp therapy. 3.Describe the pathogenesis of apical periodontal diseases. 4.Describe principles and techniques of root canal instrumentation. 5.Describe current concepts in root canal irrigation and medication. 6.Describe several root canal filling techniques 7.Describe prognostic factors of endodontic treatment. 【Study method・attention】 We will indicate learning contents and methods without lecture at the beginning of the course.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/7	Guidance	The details will be provided at the first lecture.		Yuichiro Noiri
2, 3	4/14 4/21	Pathogenesis of pulpal diseases①～②	Original handouts		Yuichiro Noiri
4, 5	4/28 5/12	Vital pulp therapy①～②	Original handouts		Yuichiro Noiri
6, 7	5/19 6/2	Pathogenesis of apical periodontal diseases①～②	Original handouts		Yuichiro Noiri

8, 9	6/9 6/16	Special Lecture Root canal instrumentation①～②	Original handouts	Yuichiro Noiri
10, 11	6/23 6/30	Root canal irrigation/medication①～②	Original handouts	Hidefumi Maeda Yuichiro Noiri
12, 13	7/7 7/14	Root canal filling①～②	Original handouts	Yuichiro Noiri
14, 15	7/21 7/28	Prognosis of endodontic treatment①～②	Original handouts	Yuichiro Noiri
16	8/4	Examination	Review	Yuichiro Noiri

#### 【Evaluation】

Reports (50%) and oral examination (50%)

#### 【Media】

Textbook of Endodontology 3rd ed. (Bergenholtz G *et al.*, Wiley-Blackwell, 2018) 16,252yen, related papers

Textbook of Endodontology 3rd ed. (Bergenholtz G *et al.*, Wiley-Blackwell, 2018) 16,252yen and related papers

#### 【Reference book】

Consideration in Endodontology (Ishibashi M., Ishiyaku Shuppan, 1987)

Cohen' S Pathways of the Pulp, 11th ed. (Hargreaves KM, Mosby Elsevier, 2015) 20,693yen

### IB・IIB

#### 【Course outline】

This course will offer current information on newly developed/advanced strategies in endodontic treatment

#### 【Course aim】

To understand advanced treatment strategies in endodontic diseases.

#### 【Attainment target】

After completing this course, the student should be able to:

1. Describe the diagnostic methods of endodontic diseases.
2. Describe the use of CBCT in endodontic treatment.
3. Describe physical and biological properties and clinical application of MTA.
4. Describe principles and techniques of Ni-Ti rotary instrumentation.
5. Describe principles and techniques of microendodontics.
6. Describe current concepts and techniques in root canal retreatment.
7. Describe principles and techniques of surgical endodontic treatment,
8. Discuss considerations for the endodontic treatment of traumatized teeth.

#### 【Study method・attention】

We will indicate learning contents and methods without lecture at the beginning of the course.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/6	Guidance	The details will be provided at the first lecture.	Yuichiro Noiri

2-5	10/13 10/20 10/27 11/17	Diagnosis of Endodontic disease/MS, CBCT 1-4	Original handouts	Yuichiro Noiri
6-10	11/24 12/1 12/8 12/15 12/22	Global standard of endodontic treatment1-5	Original handouts	Yuichiro Noiri
11-15	1/12 1/19 1/26 2/2 2/16	Endodontic surgery/ micro-endo & Modern endo 1-5	Original handouts	Yuichiro Noiri
16	3/1	Examination	Review	Yuichiro Noiri
<p><b>【Evaluation】</b> Reports (50%) and oral examination (50%)</p> <p><b>【Media】</b> Textbook of Endodontology 3rd ed. (Bergenholtz G <i>et al.</i>, Wiley-Blackwell, 2018) 16,252 yen and related papers</p> <p><b>【Reference book】</b> Global standard of clinical Endodontics, 2<sup>nd</sup> Ed. (Ishii H Ed, Ishiyaku Shuppan, 2020) 46,200 yen Complete MTA book, 1st Ed. (Mahmoud Torabinejad Ed, Quintessence, 2017) 15,000 yen</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5133	1	Tue/6・IA	2	9114	Lectures, demonstrations, and laboratory practices
230N5135		Tue/7・IIA			
230N5134	2	Tue/6・IB	2	9115	Lectures, demonstrations, and laboratory practices
230N5136		Tue/7・IIB			
Course	Seminar on Endodontics IA, IIA, IB, IIB				
Instructor	Associate Prof. Yuichiro Noiri (Div. Cariology, Operative Dentistry & Endodontics)				
Place	Laboratory in Div. Cariology, Operative Dentistry & Endodontics				
IA・IIA					
<b>【Course outline】</b> In this course, we will discuss the clinical tests, diagnosis and treatment of pulpal and periapical diseases, and train current endodontic treatments using newly-developed materials and instruments. <b>【Course aim】</b> To understand the clinical tests and diagnosis methods and treatments of pulpal and periapical diseases. <b>【Attainment target】</b> After completing this course, the student should be able to: 1. Describe the clinical tests and diagnosis methods of pulpal and periapical diseases. 2. Describe the vital pulp therapy. Describe the properties and usage of pulp capping materials. <b>【Study method・attention】</b> We will indicate learning contents and methods without lecture at the beginning of the course.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/4	Guidance	The details will be provided at the first lecture.		Yuichiro Noiri
2-5	4/11, 4/18 4/25, 5/2	Etiology and pathogenesis of dental caries ①～④	Original handouts		Yuichiro Noiri
6-10	5/9, 5/16, 5/23, 5/30, 6/6	Vital pulp therapy	Original handouts		Yuichiro Noiri
11-15	6/13, 6/27, 7/4, 7/11, 7/18	Properties and usage of pulp capping materials	Original handouts		Yuichiro Noiri
16	7/25	Examination	Review		Yuichiro Noiri

<p><b>【Evaluation】</b> Reports (50%) and oral examination (50%)</p> <p><b>【Media】</b> Original handouts and related research papers</p> <p><b>【Reference book】</b> Textbook of Endodontology 3rd ed. (Bergenholtz G <i>et al.</i>, Wiley-Blackwell, 2018)16,252yen Cohens' Pathway of the pulp 11ed. (Hergreaves KM <i>et al.</i>, Elsevier, 2016)20,693yen</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> In this course, we will discuss the clinical tests, diagnosis and treatment of pulpal and periapical diseases, and train current endodontic treatments using newly-developed materials and instruments.</p> <p><b>【Course aim】</b> To understand the clinical tests and diagnosis methods and treatments of pulpal and periapical diseases.</p> <p><b>【Attainment target】</b> 1. Use a microscopy in endodontic treatment. 2. Prepare root canals with NiTi rotary instruments. 3. Obturate root canals with current techniques.</p> <p><b>【Study method・attention】</b> We will indicate learning contents and methods without lecture at the beginning of the course</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	The details will be provided at the first lecture.	Yuichiro Noiri
2-5	10/10, 10/17, 10/24, 10/31	Microscopy in endodontic treatment①～④	Original handouts	Yuichiro Noiri
6-10	11/14, 11/21, 11/28, 12/5, 12/12	Root canal preparation with NiTi rotary instruments①～⑤	Original handouts	Yuichiro Noiri
11-15	12/19, 12/26, 1/16, 1/23, 1/30	Root canal filling①～⑤	Original handouts	Yuichiro Noiri
16	2/6	Examination	Review	Yuichiro Noiri
<p><b>【Evaluation】</b> Reports (50%) and oral examination (50%)</p> <p><b>【Media】</b> Original handouts and related research papers</p> <p><b>【Reference book】</b> Textbook of Endodontology 3rd ed. (Bergenholtz G <i>et al.</i>, Wiley-Blackwell, 2018)16,252yen Cohens' Pathway of the pulp 11ed. (Hergreaves KM <i>et al.</i>, Elsevier, 2016)20,693yen</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5137	1	Fri/4・IA	2	9114	Lectures, demonstrations, and laboratory practices
230N5139		Fri/5・IIA			
230N5138	2	Fri/4・IB	2	9115	Lectures, demonstrations, and laboratory practices
230N5140		Fri/5・IIB			
Course	Seminar on cariology IA, IIA, IB, IIB				
Instructor	Lecture Nagako Yoshiba (Clinic of Cariology, Operative Dentistry & Endodontics) Prof. Mikako Hayashi				
Place	Laboratory in Div. Cariology, Operative Dentistry & Endodontics				
IA・IIA					
<p>【Course outline】</p> <p>This course deals with basic and clinical cariology. We will discuss the cause, condition and risk factor of caries and also diagnosis methods and treatment of caries based on the risk factor analysis.</p> <p>【Course aim】</p> <p>To understand diagnosis methods of caries based on the risk factor analysis.</p> <p>【Attainment target】</p> <p>1.Describe the etiology and pathogenesis of dental caries.</p> <p>2.Analyze caries risk factors.</p> <p>3.Describe diagnosis methods of caries.</p> <p>【Study method・attention】</p> <p>Lectures, demonstrations, and laboratory practices</p> <p>We will indicate learning contents and methods at the beginning of the course.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/7	Guidance	The details will be provided at the first lecture.		Yoshiba N
2-5	4/14 4/21 4/28 5/12	Etiology and pathogenesis of dental caries 1-4	Original handouts		Yoshiba N
6-10	5/19 5/26 6/2 6/9 6/16	Caries risk factor analysis 1-5	Original handouts		Yoshiba N
11-15	6/23 6/30	Diagnosis methods of caries 1-5	Original handouts		Yoshiba N

	7/7 7/14 7/21			
16	7/28	Examination	Review	Yoshida N
<p><b>【Evaluation】</b> Reports (50%) and oral examination (50%)</p> <p><b>【Media】</b> Original handouts and related research papers</p> <p><b>【Reference book】</b> Clinical Cariology (Kumagai T et al., Ishiyaku Publishers) 24,200 yen Illustrated Cariology (Suga S., Ishiyaku Publishers) 11,650 yen</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course deals with basic and clinical cariology. We will discuss the cause, condition and risk factor of caries and also diagnosis methods and treatment of caries based on the risk factor analysis.</p> <p><b>【Course aim】</b> To understand treatment of caries based on the risk factor analysis.</p> <p><b>【Attainment target】</b> 1. Describe caries treatment based on the risk factor analysis. 2. Describe and treat caries with laser. 3. Describe and treat caries with antibacterial agents. 4. Describe and treat caries with various pulp capping agents.</p> <p><b>【Study method・attention】</b> Lectures, demonstrations, and laboratory practices We will indicate learning contents and methods at the beginning of the course.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/6	Special Lecture	The details will be provided at the first lecture.	Hayashi M
2-5	10/13 10/20 10/27 11/10	Guidance Caries treatment based on the risk factor analysis 1-4	Original handouts	Yoshida N Yoshida N Yoshida N Yoshida N
6-10	11/17 11/24 12/1 12/8 12/15	Caries treatment with laser 1-5	Original handouts	Yoshida N
11-15	12/22	Caries treatment with antibacterial agents 1-5	Original handouts	Yoshida N

	1/12 1/19 1/26 2/2			
16	2/9	Examination	Review	Yoshida N
<p><b>【Evaluation】</b>  Reports (50%) and oral examination (50%)</p> <p><b>【Media】</b>  Original handouts and related research papers</p> <p><b>【Reference book】</b>  Clinical Cariology (Kumagai T et al., Ishiyaku Publishers) 24,200 yen  Illustrated Cariology (Suga S., Ishiyaku Publishers) 11,650 yen</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5141	1	TUE／1 IA	2	9214	Lecture
230N5143		TUE／6 IIA			
230N5142	2	TUE／1 IB	2	9215	Lecture
230N5144		TUE／6 IIB			
Course	Global Oral Epidemiology IA, IIA, IB, IIB				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	Seminar room (Div. Preventive Dentistry)				
I					
<b>【Course outline】</b> This course deals with changing pattern of oral disease so called natural history to develop programme of oral disease prevention and oral health promotion					
<b>【Course aim】</b> This course focus to learn several thematic units included basic philosophy, epidemiology of oral diseases, etiologies of oral disease, social and culture risk factors.					
<b>【Attainment target】</b> This course is designed to help English skills in the international dentistry. The aim is to give the students confidence to discuss about global oral health.					
<b>【Study method・attention】</b> In this tutorial, each of content will include a lecture component and a group discussion component. Lecture materials will be suggested accordingly.					
<b>【Plan】</b>					
No.	Date	Contents	Preparing learning	Instructor	
1	April 11	Guidance	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
2	April 18	Caries epidemiology I	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
3	April 25	Caries epidemiology II	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
4	May 2	Risk factor for dental caries I	Lecture materials will be suggested accordingly	OGAWA Hiroshi	
5	May 9	Risk factor for dental caries II	Lecture materials will be suggested	OGAWA Hiroshi	

			accordingly	
6	May 16	Intervention for dental caries prevention	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	May 23	Caries epidemiology, risk factor and preventive intervention	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	May 30	Global epidemiology of periodontal disease I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	June 6	Global epidemiology of periodontal disease II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	June 13	Risk factor for periodontal diseases I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
11	June 20	Risk factor for periodontal diseases II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
12	June 27	Strategy for periodontal diseases prevention I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	July 4	Strategy for periodontal diseases prevention II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	July 11	Prevalence of oral cancer/ precancer I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
15	July 18	Prevalence of oral cancer/ precancer II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
16	July 25	Presentation	Preparation for presentation	OGAWA Hiroshi
<p><b>【Evaluation】</b>  Oral test or written examination (80%) and participation status (20%).</p> <p><b>【Media】</b>  The WHO Global Oral Health Report and related publications.</p> <p><b>【Reference book】</b>  References will be indicated if required.</p>				

## II

### 【Course outline】

This course provides students with conceptual and practical skills to design and evaluate global oral health promotion policies and programmes. Global oral health promotion draws on ideas from sociology, psychology, anthropology, education, epidemiology and other disciplines to understand how the oral health of global populations can be maintained and strengthened.

### 【Course aim】

Students should be able to demonstrate ability to apply knowledge of the core disciplines of global oral health, consisting oral health promotion, oral epidemiology, statistics, health economics and social research, distribution of oral diseases and conditions, prevention of oral diseases in public health, to real oral health problems globally.

### 【Attainment target】

By the end of this course, students should be able to demonstrate knowledge and understanding of the principal theories, methods and interventions used in oral health promotion, understand the development of the discipline of global oral health promotion, assess the appropriate use of population-wide versus targeted oral health promotion interventions, formulate oral health promotion policy and practice that is relevant to varying needs in diverse contexts, be able to appraise and communicate research evidence, apply the knowledge and analytical skills gained to inform oral health promotion policy-making, programme planning, implementation and evaluation.

### 【Study method・attention】

This is a discussion-based critical thinking course that examines the extensive relationship between oral health and global health, and concept development is heavily determined by course participation. Instructor will inform students of each class date and time, according to their schedule. Instructors explain how to prepare for each lecture on the 1st class.

### 【Plan】

No.	Date	Contents	Preparing learning	Instructor
1	October 3	Risk factor oral cancer/ precancer I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
2	October 10	Risk factor oral cancer/ precancer II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
3	October 17	Strategy for oral cancer/ precancer prevention	Lecture materials will be suggested accordingly	OGAWA Hiroshi
4	October 24	Oral health in developing countries	Lecture materials will be suggested accordingly	OGAWA Hiroshi
5	October 31	Oral health strategy in developing countries	Lecture materials will be suggested accordingly	OGAWA Hiroshi

6	November 7	Oral health planning in developing countries	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	November 14	Oral health activities in developing countries	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	November 21	Oral disease prevention programme I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	November 28	Oral disease prevention programme II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	December 5	Oral health policy I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
11	December 12	Oral health policy II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
12	December 19	Challenges of global oral health I	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	December 26	Challenges of global oral health II	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	January 16	Summary and discussion	Review the course	OGAWA Hiroshi
15	January 23	Summary and discussion	Review the course	OGAWA Hiroshi
16	January 30	Presentation	Preparation for presentation	OGAWA Hiroshi
<p><b>【Evaluation】</b> Oral test or written examination (80%) and participation status (20%).</p> <p><b>【Media】</b> The WHO Global Oral Health Report and related publications.</p> <p><b>【Reference book】</b> References will be indicated if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5145	1	THU／4 IA	2	9214	Practice
230N5147		THU／6 IB			
230N5146	2	THU／4 IIA	2	9215	Practice
230N5148		THU／6 IIB			
Course	Practical Global Oral Health Science IA, IIA, IB, IIB				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	Seminar room (Div. Preventive Dentistry)				
I					
<p>【Course outline】</p> <p>This course provides students with a sound understanding of the theoretical and empirical basis of oral health promotion globally. Global oral health promotion draws on ideas from sociology, psychology, anthropology, education, epidemiology and other disciplines to understand how the oral health of global populations can be maintained and strengthened.</p> <p>【Course aim】</p> <p>Students should be deepen knowledge and skill of the core disciplines of global oral health, consisting oral health promotion, oral epidemiology, statistics, health economics and social research, distribution of oral diseases and conditions, prevention of oral diseases in public health, to real oral health problems globally.</p> <p>【Attainment target】</p> <p>Students should be able to demonstrate knowledge and understanding of the principal theories, methods and interventions used in oral health promotion, understand the development of the discipline of global oral health promotion.</p> <p>【Study method・attention】</p> <p>This is a discussion-based critical thinking course that examines the extensive relationship between oral health and global health, and concept development is heavily determined by course participation. Instructor will inform students of each class date and time, according to their schedule. Instructors explain how to prepare for each lecture on the 1st class.</p>					
【Plan】					
No.	Date	Contents	Preparing learning		Instructor
1	April 6	Guidance	Lecture materials will be suggested accordingly		OGAWA Hiroshi
2	April 13	Health Promotion Theory, Approaches, Methods and Global Oral Health 1	Lecture materials will be suggested accordingly		OGAWA Hiroshi
3	April 20	Health Promotion Theory, Approaches, Methods and Global Oral Health 2	Lecture materials will be suggested accordingly		OGAWA Hiroshi



4	April 27	Basic Epidemiology, Design & Analysis of Global Oral Epidemiological Studies 1	Lecture materials will be suggested accordingly	OGAWA Hiroshi
5	May 11	Basic Epidemiology, Design & Analysis of Global Oral Epidemiological Studies 2	Lecture materials will be suggested accordingly	OGAWA Hiroshi
6	May 18	Basic Statistics for Global Oral Health & Policy, Statistical Methods in Oral Epidemiology	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	May 25	Introduction to Global Oral Health Economics, Principles of Social Research	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	June 1	Global Oral Health Surveillance, Goals and Information System 1	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	June 8	Global Oral Health Surveillance, Goals and Information System 2	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	June 15	Oral Health Surveys Methods 1	Lecture materials will be suggested accordingly	OGAWA Hiroshi
11	June 22	Oral Health Surveys Methods 2	Lecture materials will be suggested accordingly	OGAWA Hiroshi
12	June 29	Oral Health Surveys Methods 3	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	July 6	Strategy and Approach in Oral Disease Prevention and Health Promotion Globally 1	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	July 13	Strategy and Approach in Oral Disease Prevention and Health Promotion Globally 2	Lecture materials will be suggested accordingly	OGAWA Hiroshi
15	July 20	Presentation and grand discussion 1	Preparation for presentation	OGAWA Hiroshi
16	July 27	Presentation and grand discussion 2	Preparation for presentation	OGAWA Hiroshi
<b>【Evaluation】</b> Evaluated by debates (20%), assignments (50%) and presentations (30%).				

<p><b>【Media】</b> WHO World Oral Health Report, etc WHO publications.</p> <p><b>【Reference book】</b> References will be indicated if required.</p>				
II				
<p><b>【Course outline】</b> This course provides students with conceptual and practical skills to design and evaluate global oral health promotion policies and programmes. Global oral health promotion draws on ideas from sociology, psychology, anthropology, education, epidemiology and other disciplines to understand how the oral health of global populations can be maintained and strengthened.</p> <p><b>【Course aim】</b> Students should be able to demonstrate ability to apply knowledge of the core disciplines of global oral health, consisting oral health promotion, oral epidemiology, statistics, health economics and social research, distribution of oral diseases and conditions, prevention of oral diseases in public health, to real oral health problems globally.</p> <p><b>【Attainment target】</b> By the end of this course, students should be able to demonstrate knowledge and understanding of the principal theories, methods and interventions used in oral health promotion, understand the development of the discipline of global oral health promotion, assess the appropriate use of population-wide versus targeted oral health promotion interventions, formulate oral health promotion policy and practice that is relevant to varying needs in diverse contexts, be able to appraise and communicate research evidence, apply the knowledge and analytical skills gained to inform oral health promotion policy-making, programme planning, implementation and evaluation.</p> <p><b>【Study method・attention】</b> This is a discussion-based critical thinking course that examines the extensive relationship between oral health and global health, and concept development is heavily determined by course participation. Instructor will inform students of each class date and time, according to their schedule. Instructors explain how to prepare for each lecture on the 1st class.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Preparing learning	Instructor
1	October 5	Oral health care delivery system (Oral health services accessibility, delivery of oral health care)	Lecture materials will be suggested accordingly	OGAWA Hiroshi
2	October 12	Global status of oral health care delivery system	Lecture materials will be suggested accordingly	OGAWA Hiroshi
3	October 19	Roles that the workforce can play in improving the oral care delivery model	Lecture materials will be suggested accordingly	OGAWA Hiroshi
4	October 26	Evaluation of oral health care delivery system	Lecture materials will be suggested accordingly	OGAWA Hiroshi

5	November 2	Change and development of oral health care delivery system	Lecture materials will be suggested accordingly	OGAWA Hiroshi
6	November 9	Transform oral health care (Oral health care services and oral disease prevention into primary health care delivery sites)	Lecture materials will be suggested accordingly	OGAWA Hiroshi
7	November 16	Increase access to primary oral health care services and to oral disease preventive services	Lecture materials will be suggested accordingly	OGAWA Hiroshi
8	November 30	Strengthen the nation's health and human service infrastructure and workforce	Lecture materials will be suggested accordingly	OGAWA Hiroshi
9	December 7	Public Health Service (Structure of oral health coordinating committees)	Lecture materials will be suggested accordingly	OGAWA Hiroshi
10	December 14	Case study 1: Highlight the oral health needs of specific population groups	Lecture materials will be suggested accordingly	OGAWA Hiroshi
11	December 21	Case study 2: Identify successes and challenges of current oral health care delivery	Lecture materials will be suggested accordingly	OGAWA Hiroshi
12	January 11	Case study 3: Propose workforce innovations that would overcome access challenges	Lecture materials will be suggested accordingly	OGAWA Hiroshi
13	January 18	Case study 4: Present policy considerations aimed at advancing delivery system improvements	Lecture materials will be suggested accordingly	OGAWA Hiroshi
14	January 25	Presentation	Preparation for presentation	OGAWA Hiroshi
15	February 1	Presentation	Preparation for presentation	OGAWA Hiroshi
16	February 8	Summary and evaluation	Review the course	OGAWA Hiroshi

**【Evaluation】**

Evaluated by debates (20%), assignments (50%) and presentations (30%).

**【Media】**

WHO World Oral Health Report, etc WHO publications.

**【Reference book】**

References will be indicated if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5154	1	WED/1・I A	2	9214	Practice
230N5156		WED/6・II A			
230N5155	2	WED/1・I B	2	9214	Practice
230N5157		WED/6・II B			
Course	Seminar on Preventative dentistry IA, IIA, IB, IIB				
Instructor	Associate Professor TAKEHARA Sachiko (Div Preventive Dentistry) Lecturer KANEKO Noboru (Preventive Dentistry Clinic) Professor NOHNO Kaname (Div Oral Health Promotion)				
Place	Laboratory in the Division of Preventive Dentistry				
<p><b>【Course outline】</b> This course deals with clinical preventive dentistry included halitosis.</p> <p><b>【Course aim】</b> The aim of this course is to learn basic knowledge of clinical preventive dentistry and acquire latest skills for examination, diagnosis and treatment.</p> <p><b>【Attainment target】</b> The students should be able to do as follows:</p> <ul style="list-style-type: none"><li>・to perform dental practices from the point of view in preventative dentistry,</li><li>・to examine patient’ s oral malodor by organoleptic test and gas chromatography measurement and</li><li>・to accurately explain the results of examinations and to precisely answer to patient’ s questions.</li></ul> <p><b>【Study method・attention】</b> This course consists of lecture and practice component if students may deal with actual patients in the preventive dentistry clinic.</p>					
I		【Plan】			
No.	Date	Contents	Preparing learning		Instructor
1	April 12	Guidance	Lecture materials will be suggested accordingly		TAKEHARA Sachiko
2	April 19	Communications with patients by medical interview	Lecture materials will be suggested accordingly		TAKEHARA Sachiko
3	April 26	Oral health instruction and health promotion	Lecture materials will be suggested accordingly		TAKEHARA Sachiko
4	May 10	Clinical examinations and screening of dental caries	Lecture materials will be suggested accordingly		KANEKO Noboru

5	May 17	Instruments and devices for initial caries detection	Lecture materials will be suggested accordingly	KANEKO Noboru
6	May 24	Assessment of caries risk	Lecture materials will be suggested accordingly	KANEKO Noboru
7	May 31	Preventive care for dental caries (oral hygiene instruction)	Lecture materials will be suggested accordingly	KANEKO Noboru
8	June 7	Preventive care for dental caries (topical fluoride application)	Lecture materials will be suggested accordingly	KANEKO Noboru
9	June 14	Preventive care for caries (fissure sealant)	Lecture materials will be suggested accordingly	KANEKO Noboru
10	June 21	Clinical examinations and screening of periodontal diseases	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
11	June 28	Assessment of periodontal diseases risk	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
12	July 5	Preventive care for periodontal diseases (supra-gingival scaling)	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
13	July 12	Preventive care for periodontal diseases (scaling and root planning)	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
14	July 19	Formulation of the recall system	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
15	July 26	Summary and discussion	Review the course	TAKEHARA Sachiko
16	August 2	Presentation	Preparation for presentation	TAKEHARA Sachiko
II		【Plan】		
No.	Date	Contents	Preparing learning	Instructor
1	October 4	Interview to the patient who complains about halitosis	Lecture materials will be suggested	TAKEHARA Sachiko

			accordingly	
2	October 11	Organoleptic tests for halitosis	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
3	October 18	Halitosis examinations in the university hospital	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
4	October 25	Halitosis examinations in the university hospital	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
5	November 1	Halitosis examinations by a general practitioner	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
6	November 8	Halitosis examinations by a general practitioner	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
7	November 15	Diagnosis of genuine halitosis	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
8	November 22	Adequate treatment procedure according to diagnosis	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
9	November 29	How to deal with halitophobic patients	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
10	December 6	Mechanical cleaning for halitosis treatment	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
11	December 13	Chemical approach for halitosis prevention	Lecture materials will be suggested accordingly	TAKEHARA Sachiko
12	December 20	Psychosomatic backgrounds of halitosis	Lecture materials will be suggested accordingly	NOHNO Kaname
13	January 10	Brief psychotherapy for halitosis patients	Lecture materials will be suggested accordingly	NOHNO Kaname
14	January 17	Summary and discussion	Review of the course	TAKEHARA Sachiko

15	January 24	Summary and discussion	Review of the course	TAKEHARA Sachiko
16	January 31	Presentation	Preparation for presentation	TAKEHARA Sachiko
<p><b>【Evaluation】</b> Attendance attitude or oral test (80%) and attendance (20%).</p> <p><b>【Media】</b> • Proceedings of the Fifth International Conference on Breath Odour, Int. Dent. J., 52 (Supplement), 175-247, 2002. (In Japanese) • 口臭診療マニュアル：EBMに基づく診断と治療 宮崎秀夫編，第一歯科出版 • 口臭の疫学，臨床家のための口臭治療のガイドライン 八重垣健編著，クインテッセンス出版 • 予防歯科実践ハンドブック 予防歯科臨床教授協議会編，医歯薬出版</p> <p><b>【Reference book】</b> References will be indicated if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5158	1	Tue /1・IA	2	9114	Lecture
230N5160		Tue /6・IIA			
230N5159	2	Tue /1・IB	2	9115	Lecture
230N5161		Tue /6・IIB			
Course	Dentistry for Child Health and Development (DCHD) IA, IIA, IB, IIB				
Instructor	Prof. HAYASAKI, Haruaki (Div. Pediatric Dentistry) Assistant Prof. HANASAKI, Mika (Div. Pediatric Dentistry)				
Place	Seminar Room in Division of Pediatric Dentistry				
IA・IIA					
<p>【Course outline】</p> <p>Dentistry for child health and development is the science for oral diseases that occur in the newborn, the infant, the school age, the adolescence and even the adult rears next generation, which is called as the reproduction cycle. In this lecture, the research method is discussed through several common oral diseases seen in the young population.</p> <p>【Course aim】</p> <p>1. To learn several oral diseases which occur in young population.</p> <p>2. To learn the epidemiological researches on the typical oral diseases in young population.</p> <p>3. To discuss the research methods concerning to dentistry for child health and development.</p> <p>【Attainment target】</p> <p>1. To explain chronologically several oral diseases which occur in young population.</p> <p>2. To enumerate the cause, the treatment course and the outcome of several oral diseases.</p> <p>3. To explain the characteristic of the research method of dentistry for child health and development.</p> <p>【Study method・attention】</p> <p>Read and understand the prepared literatures thoroughly by yourself before every lecture, and join in the discussion actively on every lecture. Styles of class are lecture and group study.</p> <p>It is not allowed to take both A and B courses.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1, 2	4/4, 11	Outline of DCHD	Textbook pp2-10		HAYASAKI Haruaki
3, 4	4/18, 25	Background of Outline of DCHD	Textbook pp11-53		HAYASAKI Haruaki
5	5/2	DCHD and Cooperation	Textbook pp88-116		HANASAKI Mika
6	5/9	DCHD and Cooperation (Case Study)	Textbook pp118-138		HANASAKI Mika
7, 8	5/16, 23	Oral Disease in Child	Textbook pp54-79		HANASAKI Mika
9	5/30	Oral Habilitation of Young Child	Textbook pp200-246		HAYASAKI Haruaki



10	6/6	Evaluation of Oral Function in Child	Textbook pp518-556	HAYASAKI Haruaki
11	6/13	Self-maintenance of Oral Hygiene	Textbook pp460-489	HANASAKI Mika
12, 13	6/20, 27	Research of DCHD	Previous review.	HANASAKI Mika
14, 15	7/4, 11	Summary of DCHD	Previous review.	HAYASAKI Haruaki
16	7/18	Examination	Previous review.	HAYASAKI Haruaki

#### 【Evaluation】

Reports as the formative estimation (30%) and final oral examination (70%)

#### 【Media】

Textbook

Pediatric Dentistry - Infancy Through Adolescence-. WB Saunders Company. ISBN 0-7216-4695-6.

#### 【Reference book】

##### 1. Reference Books

- (1) Functional Occlusion. PE Dawson. MDP Company. ISBN 978-263-44313-2.
- (2) FACIAL GROWTH 3<sup>rd</sup> Edition. Donald H. Enlow. ISBN 0-7216-2843-5.

##### 2. Reference Journals

- (1) Pediatric Dentistry  
(*Journal of American Academy of Pediatric Dentistry*)
- (2) International Journal of Paediatric Dentistry  
(*Journal of the British Society of Paediatric and the International Journal of Pediatric Dentistry*)
- (3) Pediatric Dental Journal  
(*International Journal of Japanese Society of Pediatric Dentistry*)
- (4) The Journal of Clinical Pediatric Dentistry

#### IB・IIB

#### 【Course outline】

Dentistry for child health and development is the science for oral diseases that occur in the newborn, the infant, the school age, the adolescence and even the adult rears next generation, which is called as the reproduction cycle. In this lecture, the research method is discussed through several common oral diseases seen in the young population.

#### 【Course aim】

1. To learn several oral diseases which occur in young population.
2. To learn the epidemiological researches on the typical oral diseases in young population.
3. To discuss the research methods concerning to dentistry for child health and development.

#### 【Attainment target】

1. To explain chronologically several oral diseases which occur in young population.
2. To enumerate the cause, the treatment course and the outcome of several oral diseases.
3. To explain the characteristic of the research method of dentistry for child health and development.

#### 【Study method・attention】

Read and understand the prepared literatures thoroughly by yourself before every lecture, and join in the discussion actively on every lecture.

It is not allowed to take both A and B courses.

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1, 2	10/3, 10	Outline of DCHD	Textbook pp2-10	HAYASAKI Haruaki
3, 4	10/17, 24	Background of Outline of DCHD	Textbook pp11-53	HAYASAKI Haruaki
5	10/31	DCHD and Cooperation	Textbook pp88-116	HANASAKI Mika
6	11/7	DCHD and Cooperation (Case Study)	Textbook pp118-138	HANASAKI Mika
7, 8	11/14, 21	Oral Disease in Child	Textbook pp54-79	HANASAKI Mika
9	11/28	Oral Habilitation of Young Child	Textbook pp200-246	HAYASAKI Haruaki
10	12/5	Evaluation of Oral Function in Child	Textbook pp518-556	HAYASAKI Haruaki
11	12/12	Self-maintenance of Oral Hygiene	Textbook pp460-489	HANASAKI Mika
12, 13	12/19, 1/16	Research of DCHD	Previous review.	HANASAKI Mika
14, 15	1/23, 30	Summary of DCHD	Previous review.	HAYASAKI Haruaki
16	2/6	Examination	Previous review.	HAYASAKI Haruaki
<p><b>【Evaluation】</b>  Reports as the formative estimation (30%) and final oral examination (70%)</p> <p><b>【Media】</b>  Textbook  Pediatric Dentistry - Infancy Through Adolescence-. WB Saunders Company. ISBN 0-7216-4695-6.</p> <p><b>【Reference book】</b>  1. Reference Books  (1) Functional Occlusion. PE Dawson. MDP Company. ISGN 978-263-44313-2.  (2) FACIAL GROWTH 3<sup>rd</sup> Edition. Donald H. Enlow. ISBN 0-7216-2843-5.</p> <p>2. Reference Journals  (1) Pediatric Dentistry  (<i>Journal of American Academy of Pediatric Dentistry</i>)  (2) International Journal of Paediatric Dentistry  (<i>Journal of the British Society of Paediatric and the International Journal of Pediatric Dentistry</i>)  (3) Pediatric Dental Journal  (<i>International Journal of Japanese Society of Pediatric Dentistry</i>)  (4) The Journal of Clinical Pediatric Dentistry</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5162	1	Mon/6・IA	2	9114	Lecture, Seminar
230N5164		Mon/7・IIA			
230N5163	2	Mon/6・IB	2	9115	Lecture, Seminar
230N5165		Mon/7・IIB			
Course	Practice of Pediatric Dentistry : Treatment of Children's Oral Disease IA, IIA, IB, IIB				
Instructor	Associate Prof. NAKAMURA, Yuki (Div. Pediatric Dentistry) Assistant Prof. HOZAWA, Mio (Div. Pediatric Dentistry)				
Place	Division of Pediatric Dentistry, Clinic of Pediatric Dentistry and Special Needs Dentistry				
IA・IIA					
<b>【Course outline】</b> This basic course deals with etiology, prevention, treatment and management of children's oral disease.					
<b>【Course aim】</b> In this course, students will practice the pediatric dental diagnosis and basic treatment for children's oral disease.					
<b>【Attainment target】</b> Students are expected to be able to: 1. explain the children's oral disease. 2. understand the differences between the children's oral disease and those of adults. 3. practice the pediatric dental diagnosis and basic treatment for children's oral disease.					
<b>【Study method・attention】</b> Classes are the lectures and Practices. Read and understand the textbook and handouts thoroughly by yourself before every lecture, and join in the discussion actively on every lecture.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10	Guidance (Lecture)	Textbook2 pp1-4		Nakamura Y
2, 3	4/17 4/24	Oral disease in the developmental stage 1-2 (Lecture)	Textbook2 pp5-32		Nakamura Y
4, 5	5/1 5/8	Children's dental caries and related disease 1-2 (Lecture)	Textbook2 pp157~176, pp181~221		Nakamura Y Hozawa M
6, 7	5/15 5/22	Surgical treatment in Pediatric Dentistry 1-2 (Lecture)	Textbook2 pp177~181, pp285~296		Nakamura Y Hozawa M
8-10	5/29 6/5 6/12	Dental anomalies and the effect on the occlusion 1-3 (Lecture)	Textbook2 pp62~108, 297~337		Nakamura Y

11-14	6/19 6/26 7/3 7/24	Practice of Pediatric Dentistry 1-4 (Seminar)	Summary of handouts	Nakamura Y Hozawa M
15	7/31	Conclusion and examination (Lecture, examination)	Review	Nakamura Y
<p><b>【Evaluation】</b> Reports as the formative estimation (30%) and final oral examination (70%)</p> <p><b>【Media】</b> Textbook1.Original handouts (Pediatric Dentistry) Textbook2.Pediatric Dentistry 5<sup>th</sup> edition (Ishiyaku Publishers, Inc.) 13,000 yen</p> <p><b>【Reference book】</b> Laboratory and clinical practice 3<sup>rd</sup> edition (Ishiyaku Publishers, Inc.) 13,000 yen Dentistry for the child and adolescent 9<sup>th</sup> edition (Mosby Elsevier) 17,600 yen (reference price)</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This applied course deals with etiology, prevention, treatment and management of children's oral disease.</p> <p><b>【Course aim】</b> In this course, students will practice the pediatric dental diagnosis and applied treatment for children's oral disease, and understand the treatment considering the effects of growth and development in craniofacial area.</p> <p><b>【Attainment target】</b> Students are expected to be able to: 1. understand the effect of growth and development in craniofacial area. 2. understand the oral health care of the medically compromised children. 3. practice the pediatric dental diagnosis and applied treatment for children's oral disease.</p> <p><b>【Study method・attention】</b> Classes are the lectures and Practices. Read and understand the textbook and handouts thoroughly by yourself before every lecture, and join in the discussion actively on every lecture. It is recommended that students have taken IA or IIA.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/16	Guidance (Lecture)	Textbook2 pp1-4	Nakamura Y
2, 3	10/23 10/30	Growth and development in craniofacial area 1 (Lecture)	Textbook2 pp33~45	Nakamura Y Hozawa M
4, 5	11/6 11/13	Traumatic injury of the primary and permanent teeth 1-2 (Lecture)	Textbook2 pp237~255	Nakamura Y Hozawa M
6, 7	11/20 11/27	Dental management of medically compromised children 1-2 (Lecture)	Textbook2 pp389~431	Nakamura Y

8-10	12/4 12/11 12/18	Dental anomalies and the effect on the occlusion 4-6 (Lecture)	Summary of handouts	Nakamura Y
11-14	12/25 1/15 1/22 1/29	Practice of Pediatric Dentistry 5-8 (Seminar)	Summary of handouts	Nakamura Y Hozawa M
15	2/5	Conclusion and examination (Lecture, examination)	Review	Nakamura Y
<p><b>【Evaluation】</b>  Reports as the formative estimation (30%) and final oral examination (70%)</p> <p><b>【Media】</b>  Textbook1.Original handouts (Pediatric Dentistry)  Textbook2.Pediatric Dentistry 5<sup>th</sup> edition (Ishiyaku Publishers, Inc.) 13,000 yen</p> <p><b>【Reference book】</b>  Laboratory and clinical practice 3<sup>rd</sup> edition (Ishiyaku Publishers, Inc.) 13,000 yen  Dentistry for the child and adolescent 9<sup>th</sup> edition (Mosby Elsevier) 17,600 yen (reference price)</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5166	1	Mon/1・IA	2	9114	Lecture, Seminar
230N5168		Mon/6・IIA			
230N5167	2	Mon/1・IB	2	9115	Lecture, Seminar
230N5169		Mon/6・IIB			
Course	Seminar on Special Needs Dentistry    IA, IIA, IB, IIB				
Instructor	Lecturer Kuniko Ohshima    (Div. Pediatric Dentistry) Assistant Prof. Yuuki Sasakawa (Div. Pediatric Dentistry)				
Place	Seminar room in pediatric dentistry				
IA・IIA					
<b>【Course outline】</b> This seminar deals with managing techniques of the handicapped patient during dental treatment from physical and mental viewpoints.					
<b>【Course aim】</b> 1. To learn about the physical and mental problem during dental treatment with disabled person 2. To learn the normalization in the dental situation					
<b>【Attainment target】</b> 1. To explain the feature of handicapped patient 2. To explain the strategies for appropriate use of behavior management to the patient with behavior disorder					
<b>【Study method・attention】</b> Read and understand prepared handout thoroughly by yourself before every seminar and join in the seminar actively					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	4/10	Guidance	The details will be given in class		Ohshima K
2	4/17	Basic concept of special needs dentistry	Textbook2 pp.2-37		Sasakawa Y
3-5	4/24 5/1 5/8	Oral symptoms and dental characteristics of various disorders 1-3	Textbook2 pp.40-205		Ohshima K
6-8	5/15 5/22 5/29	Behavioral management 1-3	Textbook2 pp.208-244		Ohshima K
9, 10	6/5 6/12	Oral care and health promotion 1-2	Textbook2 pp.245-276		Ohshima K
11, 12	6/19 6/26	Risk management 1-2	Textbook2 pp.316-326		Ohshima K

13	7/3	Home dental care for children with disabilities	Handout	Sasakawa Y
14	7/10	Normalization in the dental situation	Textbook2 pp.2-37	Ohshima K
15	7/24	Summary	Review	Ohshima K
16	7/31	Examination		Sasakawa Y

#### 【Evaluation】

Oral examination (50%) and report (50%).

#### 【Media】

1. Handout supplied by Div. pediatric dentistry
2. Special Needs Dentistry 2nd edition (Ishiyaku Publishers. Inc)

#### IB・IIB

#### 【Course outline】

This seminar deals with managing techniques of the handicapped patient during dental treatment from physical and mental viewpoints.

#### 【Course aim】

To understand the physical, mental and psychological characteristics of people with special needs in order to practice their dental health and treatment.

#### 【Attainment target】

1. To explain the behavior management method necessary for dental treatment to people with special needs.
2. To make a dental health and dental treatment plan for people with special needs.
3. To practice dental treatment for people with special needs.

#### 【Study method・attention】

Read and understand prepared handout thoroughly by yourself before every seminar and join in the seminar actively

#### 【Plan】

No.	Date	Contents	Preparation and Review	Instructor
1	10/16	Guidance	The details will be given in class	Ohshima K
2-4	10/23 10/30 11/6	Management problems in the handicapped patient 1-3	Textbook2 pp.277-315	Ohshima K
5,6	11/13 11/20	Case based discussion : Intellectual disability	Handout (distributed later)	Ohshima K
7,8	11/27 12/4	Case based discussion : Autism spectrum disorder	Handout	Ohshima K
9	12/11	Case based discussion : Cerebral palsy	Handout	Ohshima K
10	12/18	Case based discussion : Muscular dystrophy	Handout	Sasakawa Y
11	12/25	Case based discussion : Sensory disorder	Handout	Ohshima K

12	1/9	Case based discussion : SMID (severe motor and intellectual disabilities)	Handout	Sasakawa Y
13	1/15	Case based discussion : Schizophrenia, depressive disorder	Handout	Sasakawa Y
14	1/22	Case based discussion : Epilepsy and syndrome	Handout	Ohshima K
15	1/29	Summary and	Review	Sasakawa Y
16	2/5	Examination		Ohshima K
<p><b>【Evaluation】</b>  Oral examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout supplied by Div. pediatric dentistry</p> <p><b>【Reference book】</b>  Special Needs Dentistry 2nd edition (Ishiyaku Publishers. Inc)</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5170	1	Mon/5・6 IA	2	9114	Lecture・Seminar・Practice
230N5172		Thu/5・6 IIA			
230N5171	2	Mon/5・6 IB	2	9115	Lecture・Seminar・Practice
230N5173		Thu/5・6 IIB			
Course	Surgical Approach for Temporomandibular Joint Diseases IA, IIA, IB, IIB				
Instructor	Associate Professor Hideaki Hirai.				
Place	Laboratory in Div. Oral and Maxillofacial Surgery.				
IA・IIA					
【Course outline】 This course deal with disease around temporomandibular joints. We discuss on diagnosis and treatment, especially surgical approach, for TMJ disease including postoperative management and prognosis.					
【Course aim】 The aim of this course is to obtain the accurate diagnosis for TMJ diseases, and to explain the indication and the complication of surgical approach and postoperative management.					
【Attainment target】 To explain the classification of functional disorders associated with jaw movement. To explain the diagnostic methods for functional disorders associated with jaw movement. To explain the diseases originated from TMJ and its differential diagnosis. To explain the classification of TMJ disorders and its differential diagnosis. To explain the surgical approaches for TMJ diseases. To explain the indication of surgical approaches to the TMJ. To explain the complications associated with the surgical approaches to the TMJ. To explain the long-term prognosis after surgical approaches to the TMJ.					
【Study method・attention】 To have a lecture on diagnostic strategies and puncture technique for TMJ disorders using some documents, slides, and/or DVD. We also discuss the prognosis of the puncture from literatures published on academic journals.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/3	Orientations and explanation on how to collect the literatures.	The details are instructed in the class.		Hirai
2	4/6	Functional disorders associated with the TMJ.	The details are instructed in the class.		Hirai
3	4/10	Diagnostic strategies for evaluation of functional disorders TMJ.	The details are instructed in the		Hirai

			class.	
4	4/13	How to use the diagnostic tulles for functional disorders associated with jaw movement.	The details are instructed in the class.	Hirai
5	4/17	Diseases originated from TMJ and its differential diagnosis.	The details are instructed in the class.	Hirai
6	4/20	Classification of TMJ disorders and differential diagnosis.	The details are instructed in the class.	Hirai
7	4/24	Indications of surgical diagnosis.	The details are instructed in the class.	Hirai
8	4/27	Pre-surgical preparation of TMJ surgeries.	The details are instructed in the class.	Hirai
9	5/8	Video presentation of the surgical approaches.	The details are instructed in the class.	Hirai
10	5/11	Post-surgical management for TMJ surgeries.	The details are instructed in the class.	Hirai
11	5/15	Literature discussion: long-term prognosis after TMJ fractures.	The details are instructed in the class.	Hirai
12	5/18	Literature discussion: long-term prognosis of surgical approaches for trismus.	The details are instructed in the class.	Hirai
13	5/22	Literature discussion: long-term prognosis of surgical approaches for internal derangement of TMJ.	The details are instructed in the class.	Hirai
14	5/25	Literature discussion: long-term prognosis after Rheumatoid arthritis.	The details are instructed in the class.	Hirai
15	5/29	Literature discussion: long-term prognosis after total reconstruction of TMJ.	The details are instructed in the class.	Hirai
16	6/1	Make some reports on literatures of TMJ surgeries.	The details are instructed in the class.	Hirai

<p><b>【Evaluation】</b> We evaluate totally collection of literatures (20%), discussion (30%), and reports (50%).</p> <p><b>【Media】</b> We indicate some guideline for TMJ treatment.</p> <p><b>【Reference book】</b> We indicate some key words for research papers and decide several literatures for discussion.</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course deal with internal derangement of temporomandibular joints. We discuss on diagnosis and treatment using puncture technique for articular spaces including postoperative management and prognosis.</p> <p><b>【Course aim】</b> The aim of this course is to obtain basic knowledge about the puncture to the articular space, for example its purpose, effectiveness, and technique.</p> <p><b>【Attainment target】</b> To explain the differential diagnosis of classification on TMJ disorders. To explain the clinical feature and mechanism of the internal derangement of TMJ. To explain the surgical strategies for TMJ. To explain the puncture technique for the articular space of TMJ. To explain the indication of puncture technique for the articular space of TMJ. To explain the complication at puncture for articular space of TMJ. To explain the long-term prognosis of puncture strategies for TMJ disorders.</p> <p><b>【Study method・attention】</b> To have a lecture on diagnostic strategies and puncture technique for TMJ disorders using some documents, slides, and/or DVD. We also discuss the prognosis of the puncture from literatures published on academic journals.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5	Orientations and explanation on how to collect the literature.	The details are instructed in the class.	Hirai
2	10/12	Clinical features and classification of TMJ dysordeers.	The details are instructed in the class.	Hirai
3	10/16	Clinical features and diagnostic and treatment strategies of internal derangement of TMJ.	The details are instructed in the class.	Hirai
4	10/19	Puncture techniques.	The details are instructed in the class.	Hirai
5	10/23	Arthrography and its ability of a diagnostic tulle.	The details are instructed in the	Hirai

			class.	
6	10/26	Pumping Manipulation.	The details are instructed in the class.	Hirai
7	10/30	Arthrocentesis.	The details are instructed in the class.	Hirai
8	11/2	Drug injections to the articular space of TMJ.	The details are instructed in the class.	Hirai
9	11/6	Arthroscope for TMJ disorders as a diagnostic and treatment tulle.	The details are instructed in the class.	Hirai
10	11/13	Literature discussion: Pumping Manipulation.	The details are instructed in the class.	Hirai
11	11/16	Literature discussion: Arthrocentesis.	The details are instructed in the class.	Hirai
12	11/20	Literature discussion: drug injection for TMJ articular space.	The details are instructed in the class.	Hirai
13	11/27	Literature discussion: Arthroscopic surgeries.	The details are instructed in the class.	Hirai
14	11/30	Literature discussion: natural course on internal derangements of TMJ TypeⅢ.	The details are instructed in the class.	Hirai
15	12/4	Literature discussion: natural course on internal derangements of TMJ typeⅣ.	The details are instructed in the class.	Hirai
16	12/7	Make some reports on puncture techniques.	The details are instructed in the class.	Hirai
<p><b>【Evaluation】</b>  We evaluate totally collection of literatures and discussion (50%), additionally reports (50%).</p> <p><b>【Media】</b>  We indicate some guideline for TMJ treatment.</p> <p><b>【Reference book】</b>  We indicate some key words for research papers and decide several literatures for discussion.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5174	1	Wed/5・IA	2	9114	Lecture・Exercise
230N5176		Wed/6・IIA			
230N5175	2	Wed/5・IB	2	9114	Lecture・Exercise
230N5177		Wed/6・IIB			
Course	Seminar on Molecular diagnosis of the oral cancer IA, IIA, IB, IIB				
Instructor	Professor Kei Tomihara				
Place	Lecture room will be informed on submission.				
IA・IIA					
<p>【Course outline】</p> <p>Lectures will review the genetic variation that causes oral tumors and the recent topics of those molecular diagnostic procedures.</p> <p>【Course aim】</p> <p>To understand the molecular diagnostic procedures and the optimized treatment plan for each individual case.</p> <p>【Attainment target】</p> <p>Acquirement of the capability for understanding the methods for detecting the genetic change and molecular biological characteristics, and for subjectively explaining the treatment plan based on the data of biomarkers.</p> <p>【Study method・attention】</p> <p>Review of related articles, diagnostic methods, and basics of the technologies. Exercise of molecular diagnosis by statistical procedure using clinical data with biomarkers.</p>					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/5	Article review, lecture of diagnostic methods		The details are instructed in the class.	Kei Tomihara
2	4/12	Article review, lecture of diagnostic methods		The details are instructed in the class.	Kei Tomihara
3	4/19	Article review, lecture of diagnostic methods		The details are instructed in the class.	Kei Tomihara
4	4/26	Lecture of the technology of molecular analysis		The details are instructed in the class.	Kei Tomihara
5	5/17	Lecture of the technology of molecular analysis		The details are instructed in the class.	Kei Tomihara

			class.	
6	5/24	Lecture of the technology of molecular analysis	The details are instructed in the class.	Kei Tomihara
7	5/31	Experimental data analysis	The details are instructed in the class.	Kei Tomihara
8	6/7	Experimental data analysis	The details are instructed in the class.	Kei Tomihara
9	6/21	Experimental data analysis	The details are instructed in the class.	Kei Tomihara
10	6/28	Comparative analysis of experimental and clinical data	The details are instructed in the class.	Kei Tomihara
11	7/5	Comparative analysis of experimental and clinical data	The details are instructed in the class.	Kei Tomihara
12	7/12	Comparative analysis of experimental and clinical data	The details are instructed in the class.	Kei Tomihara
13	7/19	Exercise of the statistical analysis	The details are instructed in the class.	Kei Tomihara
14	7/26	Exercise of the statistical analysis	The details are instructed in the class.	Kei Tomihara
15	8/9	Summary and conclusions	The details are instructed in the class.	Kei Tomihara
<p><b>【Evaluation】</b>  Oral examination 20%, written examination 60%, Report 20%</p> <p><b>【Media】</b>  *No indicated text books.  *Printed materials will be handed if necessary.</p>				

**【Course outline】**

Lectures will review the genetic (genomic) variation that cause oral tumors and the recent topics of those molecular diagnostic procedures.

**【Course aim】**

To understand the genomic diagnosis procedures and the optimized treatment plan for each individual case.

**【Attainment target】**

Acquirement of the capability for understanding the methods for detecting the genetic change and molecular biological characteristics, and for subjectively explaining the treatment plan based on the data of biomarkers.

**【Study method・attention】**

Review of related articles, diagnostic methods, and basics of the technologies. Exercise of molecular diagnosis by statistical procedure using clinical data with biomarkers.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Article review, lecture of diagnostic methods	The details are instructed in the class.	Kei Tomihara
2	10/11	Article review, lecture of diagnostic methods	The details are instructed in the class.	Kei Tomihara
3	10/25	Article review, lecture of diagnostic methods	The details are instructed in the class.	Kei Tomihara
4	11/1	Lecture of the technology of molecular analysis	The details are instructed in the class.	Kei Tomihara
5	11/8	Lecture of the technology of molecular analysis	The details are instructed in the class.	Kei Tomihara
6	11/15	Lecture of the technology of molecular analysis	The details are instructed in the class.	Kei Tomihara
7	11/22	Article review 1, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
8	11/29	Article review 1, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara

9	12/6	Article review 2, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
10	12/13	Article review 2, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
11	12/20	Article review 3, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
12	1/10	Article review 3, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
13	1/17	Article review 4, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
14	2/7	Article review 4, lecture of diagnostic methods and scientific backgrounds	The details are instructed in the class.	Kei Tomihara
15	2/14	Summary and conclusions	The details are instructed in the class.	Kei Tomihara
<p><b>【Evaluation】</b>  Oral examination 20%, written examination 60%, Report 20%</p> <p><b>【Media】</b>  *No indicated text books.  *Printed materials will be handed if necessary.</p> <p><b>【Reference book】</b>  • Fonseca R. J., eds. Oral and Maxillofacial Surgery. Philadelphia (1999)</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5178	1	Thu/7・I A	2	9114	Lecture
230N5180		Thu/7・II A			
230N5179	2	Thu/7・I B	2	9115	Lecture
230N5181		Thu/7・II B			
Course	Oral Implantology IA, IIA, IB, IIB				
Instructor	Prof. Katsumi Uoshima (Div. of Bio-Prosthodontics)				
Place	C412 Common Seminar Room				
IA・IIA					
<p>【Course outline】</p> <p>Lectures will be given about the backgrounds and basics of dental implant, clinically important anatomy that is related to implant, key concepts of implant application.</p> <p>【Course aim】</p> <p>The purpose of these lectures is to fully understand current dental implant, acquire the knowledge of anatomy and prosthodontics for successful implant applications.</p> <p>【Attainment target】</p> <ol style="list-style-type: none"><li>1. To explain the history of the dental implant.</li><li>2. To enumerate the importance of the dental implant.</li><li>3. To enumerate the indications of the dental implant.</li><li>4. To explain the relation between the kind and indications of the dental implant.</li><li>5. To explain the advantage and the fault of the dental implant.</li><li>6. To explain the dangers of the dental implant.</li><li>7. To explain the clinical procedures of the dental implant.</li><li>8. To explain anatomical structure of implant related sites.</li><li>10. To explain the superstructure of the dental implant.</li></ol> <p>【Study method・attention】</p> <p>Please understand the outline of implant therapy and clinical procedures of dental implant application prior to the lectures. To understand the current clinical problems, you will be required to access the Web site frequently during the lectures. Therefore, devices for this purpose are required. Necessary text will be provided prior to the lectures and please study these contents in advance.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/6	Guidance	The details will be given in the lecture.	Uoshima	
2	4/13 4/20 4/27 5/11	Outline of dental implants	The outline of dental implant should be understood by some textbook.	Uoshima	

3	5/18 5/25 6/1 6/8 6/15	Anatomy for dental implants	Oral and maxillofacial anatomy should be understood by some textbook.	Uoshima
4	6/22 6/29 7/6 7/13	Prosthodontic design of dental implants	Types of implant superstructure should be understood by some textbook.	Uoshima
5	7/20	Conclusion and examination	Review of previous lectures	Uoshima

**【Evaluation】**

Learning attitude (20%) and Oral or written examination (80%).

**【Media】**

To be announced during the course.

**【Reference book】**

To be announced during the course.

**IB・IIB**

**【Course outline】**

Learn about the preoperative treatments of dental implant and understand the current status of related research along with the future challenges.

**【Course aim】**

The purpose of these lectures is to understand the dental implant related pre-treatments and current status and future perspective of dental implant related research.

**【Attainment target】**

1. To enumerate the dental implant related pre-treatments.
2. To explain the dental implant related pre-treatments.
3. The research on the dental implant until present is outlined.
4. To enumerate the problems of the dental implant research.
5. To enumerate the topics of dental implant research.
6. To enumerate the techniques of dental implant research.

**【Study method・attention】**

Regarding the research, past papers should be searched and read so that you will understand the outline of it. Then, the research techniques necessary to solve the current clinical problems will be studied through the lectures and the practical courses. The internet environment is indispensable because it is necessary to access the Web site frequently, and to retrieve the document while the course. Necessary text will be provided prior to the lectures and please study these contents in advance.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5 10/12	Implant-related pre and/or post treatments	Pre-treatment of dental implant should	Uoshima

	10/19 10/26 11/2		be understood by some textbook.	
2	11/9 11/16 11/30 12/7 12/14 12/21 1/11 1/18 1/25	Research on dental implant	Select one implant related research paper and read.	Uoshima
3	2/1	Conclusion and examination	Review of previous lectures	Uoshima
<p><b>【Evaluation】</b> Learning attitude (20%) and Oral or written examination (80%).</p> <p><b>【Media】</b> To be announced during the course.</p> <p><b>【Reference book】</b> To be announced during the course.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5182	1	(Tue/7)・IA	2	9114	Lecture, Seminar
230N5184		(Tue/7)・IIA			
230N5183	2	(Tue/7)・IB	2	9115	Lecture, Seminar
230N5185		(Tue/7)・IIB			
Course	Fixed Prosthodontic Treatment IA, IIA, IB, IIB				
Instructor	Masaru Kaku				
Place	Common Seminar Room (C412)				
IA・IIA					
<p>【Course outline】</p> <p>Appropriate design and accurate occlusal contact adjustment are crucial for the proper function and longevity of prosthodontic treatment. Classic prosthodontics tend to rely on the doctors’ experiences, however, recent prosthodontics gradually shifting to the clinical/etiological evidence-based treatment. In fact, Japan Prosthodontic Society has been consolidating the treatment guideline for some basic prosthodontic treatment. This course is aiming to obtain the indispensable knowledge about the fixed prosthodontic treatment, mainly by reviewing the literature evidences.</p> <p>【Course aim】</p> <p>The aim of this course is to acquire the knowledge which is necessary for the fixed prosthodontic treatment by literature review.</p> <p>【Attainment target】</p> <ol style="list-style-type: none"><li>1. To explain the significance of fixed prosthodontics</li><li>2. To explain the type of fixed prosthodontics</li><li>3. To explain the indication of fixed prosthodontics</li><li>4. To explain the pros and cons of fixed prosthodontics</li><li>5. To explain the technical procedure of fixed prosthodontics</li><li>6. To enumerate the occlusal relationship of fixed prosthodontics</li><li>7. To explain the periodontal reaction induced by the inappropriate fixed prosthodontics</li><li>8. To explain the diagnosis and handling of periodontal destruction caused by the inappropriate fixed prosthodontics</li></ol> <p>【Study method・attention】</p> <p>References will be provided as needed but you should learn the outline of fixed prosthodontics by textbook in advance.</p>					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/4	Guidance		The details will be given in the lecture.	KAKU
2	4/11 4/18	Significance and Type of Fixed Prosthodontic		Preparing learning with provided text.	KAKU

3	4/25 5/9 5/16 5/23	Indication of Fixed Prosthodontic	Preparing learning with provided text.	KAKU
4	5/30 6/6 6/13 6/20	Pros and Cons of Fixed Prosthodontic	Preparing learning with provided text.	KAKU
5	6/27 7/4 7/11 7/18	Treatment Planning Case 1~4	Preparing learning with provided text.	KAKU
6	7/25	Summary and Examination	Review of previous lectures	KAKU

#### 【Evaluation】

Attendance attitude (20%)

Reports imposed during the course (20%)

Written examination (60%)

#### 【Media】

The handout will be provided in each lecture.

#### 【Reference book】

Contemporary Fixed Prosthodontics, 4th Edition, Stephen Rosenstiel, Martin Land, Junhei Fujimoto

#### IB・IIB

#### 【Course outline】

Appropriate design and accurate occlusal contact adjustment are crucial for the proper function and longevity of prosthodontic treatment. Classic prosthodontics tend to rely on the doctors' experiences, however, recent prosthodontics gradually shifting to the clinical/etiological evidence-based treatment. In fact, Japan Prosthodontic Society has been consolidating the treatment guideline for some basic prosthodontic treatment. This course is aiming to obtain the indispensable knowledge about the fixed prosthodontic treatment, mainly by reviewing the literature evidences.

#### 【Course aim】

The aim of this course is to acquire the knowledge which is necessary for the fixed prosthodontic treatment by advanced literature review.

#### 【Attainment target】

1. To explain the significance of fixed prosthodontics
2. To explain the type of fixed prosthodontics
3. To explain the indication of fixed prosthodontics
4. To explain the pros and cons of fixed prosthodontics
5. To explain the technical procedure of fixed prosthodontics
6. To enumerate the occlusal relationship of fixed prosthodontics
7. To explain the periodontal reaction induced by the inappropriate fixed prosthodontics
8. To explain the diagnosis and handling of periodontal destruction caused by the inappropriate fixed prosthodontics

<b>【Study method・attention】</b> References will be provided as needed and but you should learn the outline of fixed prosthodontics by textbook in advance.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	The details will be given in the lecture.	KAKU
2	10/10 10/17	Technical Procedure of Fixed Prosthodontic	Preparing learning with provided text.	KAKU
3	10/24 11/7	Occlusal Relationship of Fixed Prosthodontics	Preparing learning with provided text.	KAKU
4	11/14 11/21	Periodontal Reaction Induced by the Inappropriate Fixed Prosthodontics	Preparing learning with provided text.	KAKU
5	11/28 12/5	Diagnosis and Handling of Periodontal Destruction Caused by the Inappropriate Fixed Prosthodontics	Preparing learning with provided text.	KAKU
6	12/12 12/19 12/26 1/16	Treatment Planning Case 1~4	Preparing learning with provided text.	KAKU
7	1/23	Summary and Examination	Review of previous lectures	KAKU
<b>【Evaluation】</b> Attendance attitude (20%) Reports imposed during the course (20%) Written examination (60%) <b>【Media】</b> The handout will be provided in each lecture. <b>【Reference book】</b> Contemporary Fixed Prosthodontics, 4th Edition, Stephen Rosenstiel, Martin Land, Junhei Fujimoto				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5186	1	Tue/6・IA	2	9114	Lecture, Seminar
230N5188		Tue/6・IIA			
230N5187	2	Tue/6・IB	2	9115	Lecture, Seminar
230N5189		Tue/6・IIB			
Course	Dental Implant treatment IA, IIA, IB, IIB				
Instructor	Katsumi Uoshima / Masako Nagasawa				
Place	C412 Common Seminar Room				
IA・IIA					
【Course outline】 Although, dental implant is one of the very effective treatment option of prosthetic dentistry, it is at higher risk of serious accident in compared with conventional prosthetic treatment. For leading dental implant treatment to a success, it is necessary to perform appropriately diagnosis and treatment planning. Among the necessary knowledge and technique regarding the dental implant treatment, this course focusing on the acquirement of treatment planning and computer aided simulation.					
【Course aim】 The aim of this course is to acquire the rudimentary knowledge and treatment planning of dental implant.					
【Attainment target】 1. To explain the pros and cons of dental implants 2. To explain the dangers of dental implants 3. To explain the clinical procedures of dental implant 4. To explain the computer aided simulation system of dental implant					
【Study method・attention】 Clinical skill will be acquired according to the recognition system of Oral Implant Clinic in Niigata University Medical and Dental Hospital. Necessary text will be provided prior to the lectures and please study these contents in advance.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance	The details will be given in the lecture.		Uoshima
2	4/18 4/25	Overview and Recent Trends	Web search about implant therapy.		Uoshima/Nagasawa
3	5/2 5/9	Anatomy for implant installation and computer simulation(lecture)	Preparing learning with provided text.		Uoshima/Nagasawa
4	5/16 5/23	Anatomy for implant installation and computer simulation(seminar)	Preparing learning with provided text.		Uoshima/Nagasawa
5	5/30	Treatment Planning Case1～7	The outline of dental		Uoshima/Nag

	6/6 6/13 6/20 6/27 7/4 7/11		implant should be understood by some textbook.	asawa
6	7/18	Summary and Examination	Review of previous lectures	Nagasawa
<p><b>【Evaluation】</b>  Attendance attitude (20%)  Reports imposed during the course (20%)  Written examination(60%)</p> <p><b>【Media】</b>  The handout will be provided in each lecture.</p> <p><b>【Reference book】</b>  Lindhe, T Karring, NP Lang, Clinical periodontology and implant dentistry, John Wiley &amp; Sons, Apr 15, 2009</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b>  Although, dental implant is one of the very effective treatment option of prosthetic dentistry, it is at higher risk of serious accident in compared with conventional prosthetic treatment. Furthermore, usage of dental implant make the treatment planning more complicated. For leading dental implant treatment to a success, it is necessary no only to perform appropriately diagnosis and treatment planning, but also selection of superstructure and occlusal adjustment are important. Among the necessary knowledge and technique regarding the dental implant treatment, this course focusing on the treatment planning from the prosthodontics point of view.</p> <p><b>【Course aim】</b>  The aim of this course is to acquire the advanced knowledge and treatment planning of dental implant.</p> <p><b>【Attainment target】</b></p> <ol style="list-style-type: none"> <li>1. To explain the pros and cons of dental implants</li> <li>2. To explain the dangers of dental implants</li> <li>3. To explain the clinical procedures of dental implant</li> <li>4. To explain the superstructure of dental implant</li> <li>5. To explain the occlusion of dental implant</li> <li>6. To explain the factors affecting the prognosis of dental implant</li> </ol> <p><b>【Study method・attention】</b>  Clinical skill will be acquired according to the recognition system of Oral Implant Clinic in Niigata University Medical and Dental Hospital. Necessary text will be provided prior to the lectures and please study these contents in advance.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	The details will be given in the lecture.	Uoshima



2	10/10 10/17	Overview and Recent Trends	Web search about implant therapy.	Uoshima/Nag asawa
3	10/24 10/31 11/7 11/14 11/21	Treatment Planning Case1~5	The outline of dental implant should be understood by some textbook.	Uoshima/Nag asawa
4	11/28 12/5 12/12 12/19	Implant Superstructure and Occlusion	Preparing learning with provided text.	Nagasawa
5	12/26 1/16	Factors Affecting Implant Prognosis	Preparing learning with provided text.	Nagasawa
6	1/23	Summary and Examination	Review of previous lectures	Nagasawa
<p><b>【Evaluation】</b>  Attendance attitude (20%)  Reports imposed during the course (20%)  Written examination(60%)</p> <p><b>【Media】</b>  The handout will be provided in each lecture.</p> <p><b>【Reference book】</b>  Lindhe, T Karring, NP Lang, Clinical periodontology and implant dentistry, John Wiley &amp; Sons, Apr 15, 2009</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5190	1	Wed/7 I A	2	9114	Seminar
230N5191		Wed/7 II A			
Course	Basic research seminar of Oral implant dentistry IA, IIA				
Instructor	Lecturer Yosuke Akiba (Div. of Bio-Prosthodontics)				
Place	C412 C4 Seminar Room				
I・II					
<b>【Course outline】</b> A clinical demand has been increased as a prosthodontics option recently. The purpose of this seminar is to understand the basics sciences of dental implant clinic such as peri-implant tissue and materials of implant fixture and to understand the outline of basic research. This seminar should contribute to the understanding and improvement of dental implant therapy for graduate student.					
<b>【Course aim】</b> To acquire the basic knowledge, skill, and attitude concerning dental implant research for success of implant therapy.					
<b>【Attainment target】</b> 1. To explain the history of the dental implant. 2. To enumerate the importance of the dental implant. 3. The research on the dental implant until present is outlined. 4. To enumerate the problems of the dental implant research. 5. To enumerate the topics of dental implant research. 6. To enumerate the techniques of dental implant research. 7. To practice the basic skills for dental implant research.					
<b>【Study method・attention】</b> Regarding the research, past papers should be searched and read so that you will understand the outline of it. Then, the research techniques necessary to solve the current basic science problems will be studied through the lectures and the practical courses. The internet environment is indispensable because it is necessary to access the Web site frequently, and to retrieve the document while the course. Necessary text will be provided prior to the lectures and please study these contents in advance.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/5	Guidance	The details will be given in the lecture.		Akiba Y
2	4/12 4/19 4/26 5/10	Outline of dental implants 1-4	Preparing learning with provided text.		Akiba Y
3	5/17	Anatomy for dental implants	Preparing learning with provided text.		Akiba Y

4	5/24	The kind and indications of the dental implant	Preparing learning with provided text.	Akiba Y
5	5/31	History of dental implant basic research	Preparing learning with provided text.	Akiba Y
6	6/7	Outline of dental implant basic research	Preparing learning with provided text.	Akiba Y
7	6/14 6/21 6/28 7/5 7/12 7/19	Reading of dental implant related papers 1-6	Select one implant related research paper and read.	Akiba Y
8	7/26	Theme and methodology of dental implant research/examination	Preparing learning with provided text	Akiba Y
<p><b>【Evaluation】</b>  Attendance to the lectures and practical courses (20%)  Reports imposed during the course (20%)  Written examination at the end (60%)</p> <p><b>【Media】</b>  The Power Point file used in the lectures will be printed out and distributed in each lecture. Additionally, texts will be distributed if necessary.</p> <p><b>【Reference book】</b>  To be announced.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5192	1	Thu/6・IA	2	9114	Lecture, Seminar
230N5193		Thu/6・IIA			
Course	Digital technology in prosthodontics IA, IIA				
Instructor	Prof. Katsumi Uoshima/ Assistant Prof. Kaori Eguchi (Div. of Bio-Prosthodontics)				
Place	C412 Common Seminar Room				
IA・IIA					
<b>【Course outline】</b>					
The digitization of dental care is progressing rapidly thanks to the development of digital technologies. In prosthodontic treatment, almost all of the processes are already being digitized, which provides various benefits to the clinical and dental laboratory procedures; however there are still challenges. In this course, the students will learn about the current state of digitization in prosthodontic treatment and its issues, based on the literature. Furthermore, the students will learn and practice how to design crowns using the digital/ optical impression methods and CAD/CAM system.					
<b>【Course aim】</b>					
The aim of this course is to acquire the basic knowledge and skills necessary for prosthodontic treatment using digital technology.					
<b>【Attainment target】</b>					
At the end of the course, the students will be able to:					
1. Explain how to utilize digital technology in prosthodontic treatments.					
2. Explain the digital workflow in the prosthodontic treatments.					
3. Explain the pros and cons of digitization in clinical and dental laboratory procedures.					
4. Practice how to take digital impressions using an intraoral scanner.					
5. Practice how to design crowns using CAD systems.					
6. Explain the indications and the type of materials used in fixed dental prosthesis with CAD/CAM systems.					
<b>【Study method・attention】</b>					
Necessary literature will be provided prior to the lectures. Please study these contents in advance.					
Normally classes are held in person; however, this may be changed to online Zoom lectures (depending on the circumstances).					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/6	Guidance Outline of digital technologies in dental care	The details will be given in the lecture.		Uoshima/ Eguchi
2, 3	4/13 4/20	The use of digital technologies in prosthetic treatment examination and diagnosis	Preparing learning with provided text.		Uoshima/ Eguchi
4, 5	4/27 5/11	The use of digital technologies in crowns and fixed partial dentures	Preparing learning with provided text.		Uoshima/ Eguchi
6, 7	5/18	The use of digital technologies in removable partial	Preparing learning		Uoshima/

	5/25	dentures and complete dentures	with provided text.	Eguchi
8, 9	6/1 6/8	The use of digital technologies in dental implants	Preparing learning with provided text.	Uoshima/ Eguchi
10	6/15	Comparison of analog and digital methods	Preparing learning with provided text.	Uoshima/ Eguchi
11	6/22	Digital impression methods (lecture)	Preparing learning with provided text.	Uoshima/ Eguchi
12	6/29	How to take digital impressions using oral scanner (seminar)	Preparing learning with provided text.	Uoshima/ Eguchi
13	7/6	How to design crowns using CAD systems (lecture)	Preparing learning with provided text.	Uoshima/ Eguchi
14, 15	7/13 7/20	How to design crowns using CAD systems (seminar)	Preparing learning with provided text.	Uoshima/ Eguchi
16	7/27	Summary and Examination	Review of previous lectures	Uoshima/ Eguchi
<p><b>【Evaluation】</b>  Attendance attitude (20%)  Reports assigned during the course (20%)  Oral examination (60%)</p> <p><b>【Media】</b>  To be announced during the course. The handouts will be provided in each lecture.</p> <p><b>【Reference book】</b>  To be announced during the course.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5194	1	Wed/6・ⅠA	2	9114	Lecture and Group work/discussion
230N5196		Wed/7・ⅡA			
230N5195	2	Wed/6・ⅠB	2	9115	Lecture and Group work/discussion
230N5197		Wed/7・ⅡB			
Course	Clinical Dental Implantology ⅠA, ⅡA, ⅠB, ⅡB				
Instructor	Prof. Noritaka Fujii				
Place	Dental seminar room on 2F of west-wing hospital building, Preclinical practice room on 4F of dental school building				
ⅠA・ⅡA					
【Course outline】 The lecture concerning the principle on install operation and prosthodontic methods of the dental implant will be given.					
【Course aim】 This course aims to understand the concept of recovering treatment for missing teeth with the dental implant.					
【Attainment target】 The students will be required to explain: surgical procedure of the dental implant attention to install the dental implant components of the dental implant					
【Study method・attention】 Presentation based on the report or lecture, and discussion Preparation for each lecture will be suggested at the start of the course					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/5	Guidance		Textbook p62-79	N. Fujii
2	4/12	The history of the dental implant		Textbook p54-60 Survey on previous type of the dental implant	N. Fujii
3-5	4/19, 4/26, 5/10	The tissue property of around the dental implant		Textbook p38-53 Understanding on epithelial/connective tissue/bone around the implant	N. Fujii
6, 7	5/17, 5/24	The diagnostic method of the dental implant		Textbook p80-91 Survey on how to fabricate diagnostic	N. Fujii

			stent	
8-10	5/31, 6/7, 6/14	The procedure and the attention of the dental implant installation	Textbook p155-169、 172-193、226-238 Survey on general installation method of dental implant	N. Fujii
11-14	6/21, 6/28, 7/5, 7/12	The prosthodontic method for the dental implant	Textbook p266-276、 278-301、302-307、 328-347 Survey on prosthodontic concept for dental implant	N. Fujii
15	7/19	Conclusion	Preparation for report submission	N. Fujii
16	7/26	Examination		N. Fujii

#### 【Evaluation】

Oral examination (40%), Discussion (30%) and report (30%)

#### 【Textbook】

M. Yamazaki, T. Takahashi et al., Ultimate Guide IMPLANTS, Ishiyaku Pub(2004), 23,000yen

The presentation file using in the lecture will be distributed in each lecture.

#### 【Reference book】

N. Sato, Implant site development, Quintessence Pub(2001), 28,000yen

#### IB・IIB

#### 【Course outline】

This course deal with prosthesis by dental implant. Especially focused on the tissue reaction surrounding the implant and the function required for superstructure of the implant will be discussed

#### 【Course aim】

This course aims to acquire the basic knowledge about the tissue surrounding the implant and the characteristic caution with the superstructure of the implant. Furthermore, the students are expected to be able to point out on clinical obscure points of the dental implant.

#### 【Attainment target】

The students attending this course will be required to explain or understand

1. detail of interface between the implant and the surrounding bone
2. detail of interface between the implant and the surrounding soft tissue
3. morphological differences between the junctional epithelium and the peri-implant epithelium
4. the innervation around the implant
5. the characteristic property on the movement of the implant under the pressure
6. the attention in the case of reconstructing anterior guidance by the implant
7. an ideal occlusion for the implant installed in molar region
8. the method to make the superstructure achieving good function and shape

#### 【Study method・attention】

Presentation based on the report or lecture, and discussion

Preparation for each lecture will be suggested at the start of the course

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	Textbook p887-908	N. Fujii
2-5	10/11, 10/18, 10/25, 11/1	The Peri-implant tissues vs Periodontal tissues	Textbook p909-917 Contests Organization and understanding for given materials	N. Fujii
6	11/8	Presentation and Discussion	Preparation for the presentation and Report submission	N. Fujii
7-9	11/15, 11/22, 11/29	The properties of the superstructure and the technical procedure for the dental implant	Textbook p999-1024, 1030-1065 Contests Organization and understanding for given materials	N. Fujii
10	12/6	Presentation and Discussion	Preparation for the presentation and Report submission	N. Fujii
11-13	12/13, 12/20, 1/10	The discussion about the ideal occlusion for the dental implant	Contests Organization and understanding for given materials	N. Fujii
14	1/17	Presentation and Discussion	Preparation for the presentation and Report submission	N. Fujii
15	1/24	Conclusion	Preparation for the Discussion	N. Fujii
16	1/31	Examination		N. Fujii
<p>【Evaluation】</p> <p>Discussion (30%), report (30%) and Presentation (40%)</p> <p>【Textbook】</p> <p>J. Lindhe Clinical Periodontology and Implant Dentistry, Quintessence Pub(2005), 18,000yen</p> <p>The presentation file using in the lecture will be distributed in each lecture.</p> <p>【Reference book】</p> <p>S. Hobo, H. Hosoyama, Occlusion for Implant, Quintessence Pub(2006), 23,000yen</p> <p>M. Gross, The Science and Art of Occlusion and Oral Rehabilitation, Quintessence Pub(2016), 38,000yen</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5198	2	Thu/6 IA	2	9114	Lecture, Seminar
230N5200		Thu/7 IIA			
230N5199	2	Thu/6 IB	2	9115	Lecture, Seminar
230N5201		Thu/7 IIB			
Course	Basic Physiology of Pain IA, IIA, IB, IIB				
Instructor	Lecturer Mana Hasegawa (General Dentistry and Clinical Education Unit)				
Place	Dental seminar room on 2F of west-wing hospital building				
IA・IIA					
<b>【Course outline】</b> In this lecture, students can learn the neural mechanisms underlying the sense of pain, which is one of the sensory functions of the body and is particularly relevant to clinical dentistry					
<b>【Course aim】</b> Acquire basic neurophysiological knowledge of somatosensory perception, with a focus on the sense of pain.					
<b>【Attainment target】</b> 1. Explain the basic structure and function of the peripheral and central nervous systems. 2. Explain the function of neurons and the mechanism of excitatory conduction. 3. Explain peripheral mechanisms of pain and ascending pathways. 4. Describe the cranial neural mechanisms of the descending pain suppression system					
<b>【Study method・attention】</b> The course will be conducted in the form of lectures and exercises (group discussions). Students are expected to prepare well for the handouts and actively participate in discussions.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/6	Guidance	Handouts and Papers		Hasegawa
2-4	4/13, 20, 27	Neurons, action potentials and excitation conduction	Handouts and Papers		Hasegawa
5-7	5/11, 18, 25	Peripheral and Central nervous system	Handouts and Papers		Hasegawa
8, 9	6/1, 8	Somatic Sensory General Theory	Handouts and Papers		Hasegawa
10, 11	6/15, 22	Ascending pain pathway (1) Peripheral nerve mechanism	Handouts and Papers		Hasegawa
12, 13	6/29 7/6	Ascending pain pathway (2) Central nerve mechanism	Handouts and Papers		Hasegawa
14, 15	7/13, 20	Descending pain modulatory system	Handouts and Papers		Hasegawa

16	7/27	Conclusion and Examination	Previously Reviewed	Hasegawa
<p><b>【Evaluation】</b> Report (30%) and oral examination (40%), participation in group discussion (30%)</p> <p><b>【Media】</b> Handouts and papers will be distributed as needed.</p> <p><b>【Reference book】</b> N/A</p>				
<p><b>IB・IIB コース</b></p> <p><b>【Course outline】</b> The second semester will focus specifically on chronic pain, with research topics on related cranial nerve mechanisms.</p> <p><b>【Course aim】</b> Learn the cranial nerve mechanisms underlying the control of chronic pain in the oral-facial region. Consider the connection between basic research and clinical dentistry.</p> <p><b>【Attainment target】</b></p> <ol style="list-style-type: none"> <li>1. Explain the characteristics and differences between acute and chronic pain.</li> <li>2. Explain the classification of pain.</li> <li>3. Explain the brain neural mechanisms of stress-induced chronic pain.</li> <li>4. Explain the control of stress-induced chronic pain.</li> </ol> <p><b>【Study method・attention】</b> The course will be conducted in the form of lectures and exercises (group discussions). Students are expected to prepare well for the handouts and actively participate in discussions.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5	Guidance	Handouts and Papers	Hasegawa
2-4	10/12, 19, 26	Acute pain and chronic pain	Handouts and Papers	Hasegawa
5-6	11/2, 9	Nociceptive pain	Handouts and Papers	Hasegawa
7-8	11/16, 30	Orofacial chronic pain	Handouts and Papers	Hasegawa
9-10	12/7, 14	Relationship between psychosocial stress and chronic pain	Handouts and Papers	Hasegawa
11-12	12/21 1/11	Chronic pain and exercise	Handouts and Papers	Hasegawa
13-14	1/18, 25	Chronic Pain and Rice Fermented Extract - Sake Lees	Handouts and Papers	Hasegawa
15	2/1	Conclusion	Handouts and Papers	Hasegawa
16	2/8	Examination	Previously Reviewed	Hasegawa

**【Evaluation】**

Report (30%) and oral examination (40%), participation in group discussion (30%)

**【Media】**

Handouts and papers will be distributed as needed.

**【Reference book】**

N/A

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5202	1	Tue／6, 7・IA	2	9114	Lecture and preclinical practice
230N5204		Tue／6, 7・IIA			
230N5203	2	Tue／6, 7・IB	2	9115	Lecture and preclinical practice
230N5205		Tue／6, 7・IIB			
Course	Clinical seminar and practice training for treatment of dental caries based on clinical cariology IA, IIA, IB, IIB				
Instructor	Associate Prof. Shoji Takenaka (Div. Cariology, Operative Dentistry & Endodontics)				
Place	Laboratory in Div. Cariology, Operative Dentistry & Endodontics Preclinical basic practice room on 3F of dental school building B (B302)				
IA・IIA					
<p>【Course outline】</p> <p>FDI proposed the Minimal intervention dentistry (MI), emphasizing the importance of dental preservation in 2000. Adhesive dentistry and clinical cariology are the basis of the MI-based restorative treatment. The success of adhesive treatment depends on clinical techniques. In this course, students will learn basic clinical techniques for MI-based restorative treatment through practical training using a dental model.</p> <p>【Course aim】</p> <p>Students will learn about basic knowledge and skills for adhesive dentistry based on MI concept.</p> <p>【Attainment target】</p> <p>The students will be able to:</p> <ul style="list-style-type: none"><li>- explain MI concepts.</li><li>- explain the significance of dentin preservation in restorative treatment.</li><li>- explain the theory of dental adhesion.</li><li>- learn how to remove infected dentin based on MI through practical training.</li><li>- perform class II and IV composite restorations through dental model training</li></ul> <p>【Study method・attention】</p> <p>We will indicate learning contents and methods without lecture at the beginning of the course.</p> <p>Study was provided by lectures and practical training. The materials to prepare for practical training will be announce in advance. (Ex. Extracted human teeth, dental model). Short-term lending of reference books will be provided to a person who wants.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/4	Guidance	The details will be given in the lecture.		S. Takenaka
2, 3	4/11, 4/18	Outline of clinical cariology (lecture)	Reference book ① part I and II		S. Takenaka
4, 5	4/25,	Caries detection and removal of carious lesion	Reference book ①		S. Takenaka

	5/2	(lecture)	part III CQ4-13	
6, 7	5/9, 5/16	Caries detection and removal of carious lesion (Preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
8, 9	5/23 5/30	Direct bonded restoration (lecture)	Reference book ① part III CQ14-19, part IV	S. Takenaka
10	6/6	Direct bonded restoration- management of polymerization shrinkage (lecture)	The details will be given in the lecture.	S. Takenaka
11-15	6/13, 6/27, 7/4, 7/11 7/18	Direct bonded class II and IV restoration (Preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
16	7/25	Examination	Review previous lesson.	S. Takenaka

#### 【Evaluation】

Attitude (40%), products (30%), and oral examination (30%)

#### 【Media】

Unspecified

#### 【Reference book】

Main reference book

① [http://www.hozon.or.jp/member/publication/guideline/file/guideline\\_2015.pdf](http://www.hozon.or.jp/member/publication/guideline/file/guideline_2015.pdf)

A summary will be distributed in English.

#### IB・IIB

#### 【Course outline】

With the promotion of dental and oral health, the number of people who achieved 8020 exceeded 50%. While maintenance of occlusal function is being achieved, root caries in the elderly continues to increase and has become an important issue. The social demand for aesthetic dentistry is also increasing with the interest of the mouth. It is necessary to acquire skills to recover the natural morphology, color tone, and arrangement of teeth, rather than simply restoring occlusal function.

In this course, students will learn the knowledge and skills to deal with root caries and aesthetic dentistry that are often encountered in clinical practice.

#### 【Course aim】

Students will learn evidence-based strategies for active root caries of permanent teeth. Students will also learn the basic knowledge and skills for aesthetic restoration of teeth.

#### 【Attainment target】

The students will be able to:

- explain how to manage active root caries of permanent teeth.
- explain the types, characteristics, and indications of dental aesthetic restoration.
- restore the morphology and color tone of natural teeth according to the MI concept.

#### 【Study method・attention】

We will indicate learning contents and methods without lecture at the beginning of the course.

Study was provided by lectures and practical training. The materials to prepare for practical training will be announce in advance. (Ex. Extracted human teeth, dental model). Short-term lending of reference books will be provided to a person who wants.				
【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	The details will be given in the lecture.	S. Takenaka
2	10/10	Management for active root caries of permanent teeth (lecture)	Reference book ①	S. Takenaka
3	10/17	Management for active root caries of permanent teeth (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
4	10/24	Composite restoration (lecture)	The details will be given in the lecture.	S. Takenaka
5-8	10/31 11/7 11/14 11/21	Composite restoration (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
9	11/28	Principles of adhesive dentistry and laminate veneer (lecture)	Reference book ② P2-32, 51, 120-170.	S. Takenaka
10	12/5	Tooth preparation for laminate veneer (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
11	12/12	Tooth whitening and immediate color recovery (tooth manicure) (lecture)	The details will be given in the lecture.	S. Takenaka
12	12/19	Office whitening and immediate color recovery (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
13	12/26	Home whitening (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
14	1/16	CAD/CAM and direct crown restoration (lecture)	Reference book ② P36-53.	S. Takenaka
15	1/23	Tooth preparation for CAD/CAM inlay (preclinical practice)	Prepare a dental model and review previous lesson.	S. Takenaka
16	1/30	Examination	Review previous	S. Takenaka

			lesson.	
<p><b>【Evaluation】</b>  Attitude (40%), products (30%), and oral examination (30%)</p> <p><b>【Media】</b>  Unspecified</p> <p><b>【Reference book】</b>  Main reference book</p> <p>① <a href="http://www.hozon.or.jp/member/publication/guideline/file/guideline_2020.pdf">http://www.hozon.or.jp/member/publication/guideline/file/guideline_2020.pdf</a></p> <p>② A summary will be distributed in English.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5206	1	Wed/5, IA	2	9114	Lecture
230N5208		Wed/6, IIA			
230N5207	2	Wed/5, IB	2	9115	Lecture, Seminar
230N5209		Wed/6, IIB			
Course	Treatment of Cleft Lip and Palate IA, IIA, IB, IIB				
Instructor	Prof. Kazuhiro Ono (Division of Oral Science for Health Promotion), Dr. Jun Nihara (Division of Orhtodontics), Dr. Rei Ohminato (Niigata University of Health and Welfare)				
Place	Laboratory in Division of Oral Science for Health Promotion				
IA・IIA					
<b>【Course outline】</b> In this course, graduate students learn the symptoms and the surgical treatments of cleft lip and palate, which is a representative congenital deformity occurring in the oral and maxillofacial region. Moreover, they are expected to recognize the importance of team approach with not only surgeons but also many other specialists through discussion with instructors.					
<b>【Course aim】</b> To be mature oral surgeons and clinical researchers, students deeply understand the symptoms and the surgical treatments of cleft lip and palate.					
<b>【Attainment target】</b> Students should be able to <ul style="list-style-type: none"><li>・ explain the etiology and the symptoms of cleft lip and palate.</li><li>・ explain the surgeries (indication, timing, procedure, outcome) of cleft lip and palate.</li><li>・ explain the importance of team approach in the treatment of cleft lip and palate.</li></ul>					
<b>【Study method・attention】</b> This course is composed of lectures and discussion.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	4/12	Guidance	The details will be indicated at lectures.		Kazuhiro Ono
2	4/19	Etiology	Textbook pp5～10		Kazuhiro Ono
3	4/26	Clinical symptoms	Textbook pp5～10		Kazuhiro Ono
4	5/10	Functional problems	Textbook pp5～10		Kazuhiro Ono
5	5/17	Psycho-social problems	Textbook pp5～10		Kazuhiro Ono
6	5/24	Presurgical orthopaedics	Textbook pp11～32		Kazuhiro Ono
7	5/31	Lip repair	Textbook pp11～32		Kazuhiro Ono



8	6/7	Palatal repair 1	Textbook pp42~60	Kazuhiro Ono
9	6/14	Palatal repair 2	Textbook pp42~60	Kazuhiro Ono
10	6/21	Alveolar bone graft	Textbook pp61~67	Kazuhiro Ono
11	6/28	Secondary surgical treatments	Textbook pp11~32, 42~60	Kazuhiro Ono
12	7/5	Orthodontic treatment	Textbook pp33~41	Jun Nihara
13	7/12	Speech therapy	Textbook pp33~41	Rei Ohminato
14	7/19	Team approach	Textbook pp33~41	Kazuhiro Ono
15	7/26	Discussion	Review	Kazuhiro Ono, Jun Nihara, Rei Ohminato
16	8/2	Oral examination	Review	Kazuhiro Ono, Jun Nihara, Rei Ohminato

#### 【Evaluation】

Instructors will evaluate each student by oral examination (100%).

#### 【Media】

Textbook: “Guideline for plastic surgery part 4” Kanahara (3,300 yen)

#### 【Reference book】

“Standard textbook of plastic surgery 7<sup>th</sup> ed.” Igakushoin (5,800 yen)

“Clinical dentistry and oral surgery for speech therapists 2<sup>nd</sup> ed.” Ishiyaku (4,200 yen)

#### IB・IIB

#### 【Course outline】

In this course, graduate students research the various treatments of cleft lip and palate by using books and papers from medical institutes, including Niigata University Hospital, and present those contents. Students are expected to find the general problems by comparing with the treatments they have researched and suggest some solutions through discussion with peers and an instructor.

#### 【Course aim】

To be mature oral surgeons and clinical researchers, based on knowledge learned at the course “Treatment of Cleft Lip and Palate IA, IIA”, students deeply understand the current status and the problems of the treatment of cleft lip and palate.

#### 【Attainment target】

Students should be able to

- explain the various treatments of cleft lip and palate.
- indicate the problems of the treatment of cleft lip and palate.
- suggest some solutions of the problems they have found.

#### 【Study method・attention】

It is desirable for students to have attended the course “Treatment of Cleft Lip and Palate IA, IIA” in Semester 1. Mainly, active learning, such as presentation and discussion is used in this course.

【Plan】				
No.	Date	Contents	Preparation and Review	Instructor
1	10/4	Guidance	The details will be indicated at lectures.	Kazuhiro Ono
2	10/11	Lecture: Treatment of cleft lip and palate at Niigata University Hospital	Research of papers	Kazuhiro Ono
3	10/18	Research 1	Research of papers	Kazuhiro Ono
4	10/25	Research 2	Research of papers	Kazuhiro Ono
5	11/1	Research 3	Research of papers	Kazuhiro Ono
6	11/8	Research 4	Research of papers	Kazuhiro Ono
7	11/15	Presentation: Treatments of cleft lip and palate at other hospitals	Preparation for presentation	Kazuhiro Ono
8	11/22	Discussion: Problems of treatments	Review	Kazuhiro Ono
9	11/29	Lecture: Current status and general problems of cleft treatment	Research of papers	Kazuhiro Ono
10	12/6	Lecture: Academic writing	Research of papers	Kazuhiro Ono
11	12/13	Report making 1	Report making	Kazuhiro Ono
12	12/20	Report making 2	Report making	Kazuhiro Ono
13	1/10	Discussion: Current status and general problems of cleft treatment	Review	Kazuhiro Ono
14	1/17	Report making 3	Report making	Kazuhiro Ono
15	1/24	Report making 4 (Submit)	Report making	Kazuhiro Ono
16	1/31	Feedback	Review	Kazuhiro Ono
<p><b>【Evaluation】</b>  An instructor will evaluate each student by a presentation (50%) and a report (50%).</p> <p><b>【Media】</b>  Particularly, there is not the designation of the textbook.</p> <p><b>【Reference book】</b>  An instructor recommends students to read many reference books and research papers for presentation and report making.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5210	1	Thu/2・IA	2	9214	Lecture・Seminar
230N5212		Thu/7・IIA			
230N5211	2	Tue/2・IB	2	9215	Lecture・Seminar
230N5213		Tue/7・IIB			
Course	Seminar on oral health policy IA, IIA, IB, IIB				
Instructor	Prof. Akitugu Ohuchi (Div. of Social Welfare, Dep. of Oral Health and Welfare)				
Place	Seminar room in the Dept. of Oral Health and Welfare (Building C-7F)				
IA・IIA					
【Course outline】 This seminar deals with Analysis of various problems on oral health policy, which based on various investigation / statistics documents and methodology of policy planning to correspond to those problems.					
【Course aim】 In this course, students will understand the present condition and the problems of Oral health service in Japan, which like the supply and demand of the dental professionals and learning the methodology of policy planning to correspond to those problems.					
【Attainment target】 After this course, students should be able to; ・explain the history and backgrounds of Oral health policy in Japan. ・explain the present condition and the problems of the supply and demand of the dental professionals. ・state opinions about countermeasures for the supply and demand of the dental professionals .					
【Study method・attention】 The internet environment is indispensable to access the Statistics database Web site. Students will be required to read the pre-distributed reference documents, and to summarize the main points and your questions before each attendance.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/6	Guidance	Summarize the origins and contents of the Dentist Act, Dental Hygienist Act, and Dental Technician Act		Ohuchi
2-4	4/13 4/20 4/27	The history and backgrounds of Oral health policy	Summarize the history of Oral health policy. Details will be given in class.		Ditto
5-8	5/11 5/18	The present condition and the problems of the supply and demand of dentists in Japan	Summarize about the Estimating dentist		Ditto

	5/25 6/1		supply and demand in the past. Details will be given in class.	
9-11	6/8 6/15 6/22	The present condition and the problems of the supply and demand of dental hygienists and dental technicians in Japan	Summarize the Employment status of dental hygienists and Dental Technicians. Details will be given in class.	Ditto
12-15	6/29 7/6 7/13 7/20	Policy making practice	Review previous work and Summarize your opinion. Details will be given in class.	Ditto
16	7/27	Summary and Oral examination	Review previous work	Ditto
<b>【Evaluation】</b> Oral examination based on report of practice <b>【Media】</b> No particular textbook <b>【Reference book】</b> Related papers for public health dentistry				
<b>IB・IIB</b> <b>【Course outline】</b> This seminar deals with Analysis of various problems on oral health policy, which based on various investigation / statistics documents and methodology of policy planning to correspond to those problems. <b>【Course aim】</b> In this course, students will understand the present condition and the problems of Oral health service in Japan, which like the supply and demand of the dental professionals and learning the methodology of policy planning to correspond to those problems. <b>【Attainment target】</b> After this course, students should be able to; • explain the provision system of dental health care services. • explain the present condition and the problems (including medical economics) of dental care institutions. • state opinions about countermeasures for the provision system of dental health care services. <b>【Study method・attention】</b> The internet environment is indispensable to access the Statistics database Web site. Students will be required to read the pre-distributed reference documents, and to summarize the main points and your questions before each attendance.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	Summarize the	Ohuchi

			distribution of medical institutions in Japan.	
2-4	10/10 10/17 10/24	The present conditions of oral health service system	Summarize The present conditions of oral health service system. Details will be given in class.	Ditto
5-7	10/31 11/7 11/14	the present condition and the problems of dental clinics and hospitals	Summarize the number of patients at dental institutions. Details will be given in class.	Ditto
8-10	11/21 11/28 12/5	Macro-economy of Oral health service	Summarize the changes in dental care expenses. Details will be given in class.	Ditto
11-15	12/12 12/19 12/26 1/16 1/23	Policy making practice	Summarize the changes in dental care expenses. Details will be given in class.	Ditto
16	1/30	Summary and Oral examination	Review previous work	Ditto
<p><b>【Evaluation】</b> Oral examination based on report of practice</p> <p><b>【Media】</b> No particular textbook</p> <p><b>【Reference book】</b> Related papers for public health dentistry</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5218	1	Fri 3・IA	2	9114	Lecture
230N5220		Fri 5・IIA			
230N5219	2	Fri 3・IB	2	9115	Lecture
230N5221		Fri 5・IIB			
Course	Public health dentistry IA, IIA, IB, IIB				
Instructor	Prof. Akihiro YOSHIHARA (Div. Oral Health and Welfare)				
Place	Conference room at Div. Oral Health and Welfare				
IA・IIA					
<p>【Course outline】</p> <p>This course deals with epidemiological study in order to research valid diagnostic methods and risk factors for occurrence or progression of oral disease such as dental caries and periodontal disease, and protective factors for healthy improvement, and with the information processing: data collection and analysis using appropriate statistical method.</p> <p>【Course aim】</p> <p>In this course, students master research design and statistical analysis method from epidemiology. In addition, they establish risk factors for occurrence and progression of oral diseases such as dental caries and periodontal disease.</p> <p>【Attainment target】</p> <p>After this course, the students should be able to do for dental caries and periodontal disease as follows,</p> <ul style="list-style-type: none"><li>• master research design and bias for making research protocol.</li><li>• master how to make data files for analysis.</li><li>• master statistical methods for analysis.</li><li>• explain the risk factors and protective factors for occurrence or progression of oral diseases.</li></ul> <p>【Study method・attention】</p> <p>A lecture and field work</p> <p>Each the lecture or field work will be conducted based on the original documents. As you distribute a document beforehand, you should confirm the documents by the day.</p>					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1-2	4/ 7, 4/14	Guidance		It is not particularly necessary	Akihiro Yoshihara
3-8	4/21, 4/28 5/12, 5/19, 5/26, 6/ 2	Methodology for planning of epidemiological survey and data analysis		Confirm a document about methodology for planning of epidemiological survey and data analysis to	Akihiro Yoshihara

			distribute beforehand	
9-12	6/ 9, 6/16, 6/23, 6/30	Diagnosis of dental caries	Confirm a document about diagnosis of dental caries to distribute beforehand	Akihiro Yoshihara
13-14	7/ 7, 7/14	Risk and protective factors of dental caries	Confirm a document about risk and protective factors of dental caries to distribute beforehand	Akihiro Yoshihara
15	7/21	Diagnosis of periodontal disease	Confirm a document about diagnosis of periodontal disease to distribute beforehand	Akihiro Yoshihara
16	7/28	Examination	Review until the last session	Akihiro Yoshihara

#### 【Evaluation】

Oral test (40%) and report (60%).

#### 【Media】

The textbook is not used in the class.

#### 【Reference book】

Main reference book: Dentistry, Dental Practice and the Community 6th Edition

B.A. Burt, S.A. Eklund, W.B. (Saunders Co). 6832yen.

We provide research papers if required.

#### IB・IIB

#### 【Course outline】

This course deals with epidemiological study in order to research valid diagnostic methods and risk factors for occurrence or progression of oral diseases which are associated with general condition, and protective factors for healthy improvement, and with the information processing: data collection and analysis using appropriate statistical method. Furthermore, it allows to examine an example and to build an investigation plan based on related documents.

#### 【Course aim】

In this course, students master research design and statistical analysis method from epidemiology and risk factors for occurrence and progression of oral diseases which are associated with general condition,

#### 【Attainment target】

After this course, the students should be able to do for bone metabolism, nutrition, genetic polymorphisms, senile pneumonia and physical fitness which are related with oral disease as follows,

- master research design and bias for making research protocol.
- master how to make data files for analysis.
- master statistical methods for analysis.
- explain the risk factors and protective factors for occurrence or progression of oral diseases.

<b>【Study method・attention】</b> Each the lecture or field work will be conducted based on the original documents. As you distribute a document beforehand, you should confirm the documents by the day.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1-2	10/ 6, 10/13	Guidance	It is not particularly necessary	Akihiro Yoshihara
3-5	10/20, 10/27, 11/10	Risk and protective factors of periodontal disease	Confirm a document about risk and protective factors of periodontal disease to distribute beforehand	Akihiro Yoshihara
6-7	11/17, 11/24	Risk and protective factors for tooth loss	Confirm a document about risk and protective factors for tooth loss to distribute beforehand	Akihiro Yoshihara
8-9	12/ 1, 12/ 8	Oral disease and bone metabolism	Confirm a document about oral disease and bone metabolism to distribute beforehand	Akihiro Yoshihara
10-11	12/15, 12/22	Oral disease and nutrition	Confirm a document about oral disease and nutrition to distribute beforehand	Akihiro Yoshihara
12-13	1/12, 1/19	Oral disease and genetic polymorphisms	Confirm a document about oral disease and genetic polymorphisms to distribute beforehand	Akihiro Yoshihara
14-15	1/26, 2/ 2	Oral care and senile pneumonia and physical fitness	Confirm a document about Oral care and senile pneumonia and physical fitness to distribute beforehand	Akihiro Yoshihara
16	2/ 9	Examination	Review until the last session	Akihiro Yoshihara



**【Evaluation】**

Oral test (40%) and report (60%).

**【Media】**

The textbook is not used in the class.

**【Reference book】**

We provide research papers if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5222	1	Thurs/4・ⅠA	2	9214	Lecture
230N5224		Thurs/6・ⅡA			
230N5223	2	Thurs/4・ⅠB	2	9215	Lecture
230N5225		Thurs/6・ⅡB			
Course	Seminar on Statistics of Hygiene and Social Welfare ⅠA, ⅡA, ⅠB, ⅡB				
Instructor	Prof. Akihiro Yoshihara (Div. Oral Science for Health Promotion)				
Place	The second room, C710, Laboratory in Department of Oral Health and Welfare				
ⅠA・ⅡA					
<p>【Course outline】</p> <p>Seminar on Statistics of Hygiene and Social Welfare contains study design and setting of subjects for hygiene and social welfare.</p> <p>【Course aim】</p> <p>Students will understand practicing of the study in hygiene and social welfare.</p> <p>【Attainment target】</p> <p>Students will be able to set up study design for hygiene and social welfare.</p> <p>【Study method・attention】</p> <p>Basic knowledge of statistics will be required.</p> <p>Lecture</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1-2	4/ 6, 4/13	Guidance Introduction: Some basic concept	Textbook pp1-4, pp22-29		Akihiro Yoshihara
3-4	4/20, 4/27	Introduction: Trends and current application	Textbook pp5-16		Akihiro Yoshihara
5-7	5/11, 5/18, 5/25	Introduction: Risk factors	Textbook pp17-21, pp30-32		Akihiro Yoshihara
8-9	6/ 1, 6/ 8	Research Methodology: Design elements and sampling	Textbook pp33-47		Akihiro Yoshihara
10-11	6/15, 6/22	Research Methodology: Subject allocation and randomization	Textbook pp48-56		Akihiro Yoshihara
12-13	6/29, 7/ 6	Research Methodology: Validity and research strategies	Textbook pp57-92		Akihiro Yoshihara

14-15	7/13, 7/20	Research Methodology: Meta-analysis	Textbook pp85-92	Akihiro Yoshihara
16	7/27	Examination	Review until the last session	Akihiro Yoshihara

**【Evaluation】**

Oral test (40%) and report (60%).

**【Media】**

Translation: Masako Kihara and Masahiro Kihara: Evaluating Clinical and Public Health Interventions: A Practical Guide to Study Design and Statistics, (Medical science international) 4,070yen

**【Reference book】**

Mitchell H. Katz: Evaluating Clinical and Public Health Interventions: A Practical Guide to Study Design and Statistics, (Cambridge University Press) 4,070yen

**IB・IIB**

**【Course outline】**

Seminar on Statistics of Hygiene and Social Welfare contains measures of statistical analysis associated with for hygiene and social welfare.

**【Course aim】**

Students will understand practicing for analysis of the study in hygiene and social welfare.

**【Attainment target】**

Students will be able to practice the sampling of subjects according to statistical methods.

Students will be able to perform basic analyze using with computer-based statistical software.

**【Study method・attention】**

Basic knowledge of statistics will be required.

Lecture

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1-2	10/ 5, 10/12	Guidance Measurement: Introduction of statistical analysis	Textbook pp93-96	Akihiro Yoshihara
3-4	10/19, 10/26	Measurement: Type of variables	Textbook pp97	Akihiro Yoshihara
5-6	11/ 2, 11/ 9	Measurement: Measurement with categorical variables - Kai square test	Textbook pp98-125	Akihiro Yoshihara
7-8	11/16, 11/30	Measurement: Measurement with continuous variables - Analysis of variance	Textbook pp126-142	Akihiro Yoshihara
9-10	12/ 7, 12/14	Assessing Causation: The criteria and Correlation	Textbook pp143-150	Akihiro Yoshihara
11-12	12/21, 1/11	Assessing Causation: Regression Analysis	Textbook pp151	Akihiro Yoshihara

13-14	1/18, 1/25	Choosing the statistical methods	Textbook pp152-158	Akihiro Yoshihara
15	2/ 1	Ethics: FREELY GIVEN and INFORMED CONSENT	Textbook pp159-176	Akihiro Yoshihara
16	2/ 8	Examination	Review until the last session	Akihiro Yoshihara
<p><b>【Evaluation】</b> Oral test (40%) and report (60%).</p> <p><b>【Media】</b> Translation: Masako Kihara and Masahiro Kihara: Evaluating Clinical and Public Health Interventions: A Practical Guide to Study Design and Statistics, (Medical science international) 4,070yen</p> <p><b>【Reference book】</b> Mitchell H. Katz: Evaluating Clinical and Public Health Interventions: A Practical Guide to Study Design and Statistics, (Cambridge University Press) 4,070yen</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5226	1	Thu /5	2	9114	Seminar
230N5228		Thu /6			
230N5227	2	Thu /5	2	9115	Seminar
230N5229		Thu /6			
Course	Seminar on Biomechanics Applied to Prosthodontics IA, IIA, IB, IIB				
Instructor	Associate Prof. Roxana STEGAROIU (Dept. of Oral Health and Welfare, Div. of Oral Science for Health Promotion)				
Place	Research room #1, Dept. of Oral Health and Welfare				
IA・IIA					
<p>【Course outline】</p> <p>Before each class, the graduate students will review the mechanical principles related to the behavior of prosthetic restorations, abutment teeth, implants, and their surrounding bone, and the basic biomechanical testing methods. Based on this knowledge, they will discuss under the instructor guidance about each lesson topic and then summarize the debate results in a report.</p> <p>【Course aim】</p> <p>Students will learn about basic biomechanical principles and research methods with application in prosthodontics and implant dentistry.</p> <p>【Attainment target】</p> <p>At the end of the course, the students will be able to:</p> <ul style="list-style-type: none"><li>- explain about the application of fatigue testing in prosthodontics and implant dentistry;</li><li>- explain about the application of 3D finite element method in prosthodontics and implant dentistry;</li><li>- explain about the influence of dental material aging on the abutment teeth and surrounding tissues from a biomechanical viewpoint.</li></ul> <p>【Study method・attention】</p> <p>After a concise lecture on each class topic, related articles will be discussed in seminar style.</p>					
【Plan】					
No.	Date	Contents	Preparing learning	Instructor	
1	4/6	Guidance	The details will be provided in class	Stegaroiu R.	
2-4	4/13 4/20 4/27	Biomechanical principles with relevance for prosthodontics 1-3	Textbook① pp 1-48, 96-114, 201-216	Stegaroiu R.	
5, 6	5/11 5/18	Research methods in biomechanics 1: Basics of mechanical and fatigue testing 1,2	Textbook ① pp139-151, 173-183, 339-358	Stegaroiu R.	
7	5/25	Research methods in biomechanics 2: Strain gauge measurements	Textbook② pp 1-84	Stegaroiu R.	

8-10	6/1 6/8 6/15	Research methods in biomechanics 3: 3D finite element method (3D FEM) 1-3	Textbook③ pp 1-24, 48-69, 73-102	Stegaroiu R.
11, 12	6/22 6/29	In vivo aging of materials used in prosthodontics 1, 2	Textbook④ pp 3-58	Stegaroiu R.
13, 14	7/6 7/13	Case study: Post and core types, retention and tooth fracture risk 1, 2	Textbook⑤ pp 313-356	Stegaroiu R.
15	7/20	Summary and conclusions	Recapitulation of lessons 1-14	Stegaroiu R.
16	7/27	Oral examination	Recapitulation of lessons 1-15	Stegaroiu R.

#### 【Evaluation】

Oral examination (50%) and written report (50%).

#### 【Media】

No particular textbook.

#### 【Reference book】

- ① Mechanical Behavior of Materials: engineering methods for deformation, fracture, and fatigue (Dowling NE, Prentice Hall) 8,500 yen
- ② Strain Gauge technology 2<sup>nd</sup> edition (Window AL, Elsevier Applied Science) 10,000 yen
- ③ The Finite Element Method, (Zienkiewicz OC, McGraw-Hill) 14,500 yen
- ④ Dental Materials in Vivo Aging and Related Phenomena (Eliades G et al., Quintessence) 16,000 yen
- ⑤ Contemporary Fixed Prosthodontics 5<sup>th</sup> edition (Rosenstiel SF et al.) 45,000 yen.

#### IB・IIB

#### 【Course outline】

The graduate students will search for and read related articles about the types, designs, materials and dimensions of different prosthetic restorations, including implant superstructures, and relate their selection to the biomechanical principles studied in the previous semester. Based on this knowledge, they will discuss under the instructor guidance about appropriate selection of prosthetic restorations/implant characteristics for typical clinical cases and then summarize the debate results in a report.

#### 【Course aim】

Through various case studies, students will learn about basic applications of biomechanical principles in prosthodontics and implant dentistry.

#### 【Attainment target】

At the end of the course, the students will be able to:

- explain how the type, design, and dimensions of the dental arch restoration will influence mechanical stresses and strains in the abutment teeth;
- explain how dental implant and superstructure types, dimensions, and materials will influence mechanical stresses and strains in the bone around implants.

#### 【Study method・attention】

After a concise lecture on the topic of each lesson, related articles will be discussed in seminar style.

【Plan】				
No.	Date	Contents	Preparing learning	Instructor
1	10/5	Guidance	The details will be provided in class	Stegaroiu R.
2, 3	10/12 10/19	Case study 1: Biomechanical principles and dental arch reconstruction 1, 2	Textbook① pp 85-118	Stegaroiu R.
4, 5	10/26 11/2	Case study 2: Bone adaptation to mechanical stress/strain 1, 2	Textbook② pp 485-507	Stegaroiu R.
6, 7	11/9 11/16	Case study 3: Superstructure type and stress in and around implants 1, 2	Search for and summarize articles related to Case study 3	Stegaroiu R.
8, 9	11/30 12/7	Case study 4: Superstructure material and stress/strain in and around implants 1, 2	Search for and summarize articles related to Case study 4	Stegaroiu R.
10, 11	12/14 12/21	Case study 5: Implant type and dimensions and stress in and around implants 1, 2	Search for and summarize articles related to Case study 5	Stegaroiu R.
12, 13	1/11 1/18	Case study 6: 3D finite element analysis of precisely simulated trabecular bone 1, 2	Textbook③ pp 126-149	Stegaroiu R.
14	1/25	Case study 7: Conventional prostheses vs. implants (selection of the appropriate treatment option)	Search for and summarize articles related to Case study 7	Stegaroiu R.
15	2/1	Summary and conclusions	Recapitulation of lessons 1-14	Stegaroiu R.
16	2/8	Oral examination	Recapitulation of lessons 1-15	Stegaroiu R.
<p><b>【Evaluation】</b> Evaluation based on a written report (100%)</p> <p><b>【Media】</b> No particular textbook.</p> <p><b>【Reference book】</b>            ① Fundamentals of Fixed Prosthodontics 3<sup>th</sup> ed. (Shillingburg HT Jr. et al, Quintessence) 13,500 yen            ② Principles of Bone Biology 2nd ed. (Bilezikian JP et al, editors, Academic Press) 20,000 yen            ③ Cellular Materials in Nature and Medicine (Gibson LJ et al, Cambridge University Press) 16,600 yen</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5230	1	Any time	Any time	9014	Lecture, Seminar, Practice
Course	A course for short externship in the foreign dental schools/research institutes				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	Sister/Brother schools in the foreign countries				
<p><b>【Course outline】</b></p> <p>This course is a local activity-type program aimed to becoming a researcher with an international perspective who can actively engage in various academic activities and oral health activities in both developed and developing countries. Graduate students are expected to introduce and discuss their own research outcomes as well as to conduct medical supports and oral health activities, during their short stay (8 days to 2 weeks) at foreign dental schools or educational institutions. Students are expected to acquire a wide field of view through these activities. The contents of the program will be drafted through discussions with the recipient schools, and a detailed report must be submitted promptly after returning to Japan.</p> <p><b>【Course aim】</b></p> <ol style="list-style-type: none"><li>1. Putting themselves in English language environment and improving communication skills with local researchers and faculty members.</li><li>2. Increasing their motivation for future long-term study abroad through short-term stays at overseas dental schools or education institutions.</li><li>3. Comparing and understanding the dental environment and dental research environment of foreign countries and their own country.</li><li>4. Finding the fields to which they can contribute as dentists both internationally and domestically to expand their potential.</li></ol> <p><b>【Attainment target】</b></p> <ol style="list-style-type: none"><li>1. Make arrangements with the other party in advance using various means.</li><li>2. Plan short-term activities at dental schools or research institutes overseas.</li><li>3. Actively communicate in English during the stay.</li><li>4. Compare and understand the dental environment between other countries and their own country.</li><li>5. Compare and understand the dental research environment in other countries and their own.</li></ol> <p><b>【Study method・attention】</b></p> <ol style="list-style-type: none"><li>1. Make preliminary meetings thoroughly with your destination.</li><li>2. Actively communicate in English.</li><li>3. Actively participate in the activities provided by your school or institution.</li><li>4. Be sure to purchase overseas travel insurance for students specified by our university.</li><li>5. Always collect information from the Ministry of Foreign Affairs Overseas Safety Website.</li><li>6. Register the period of your stay and place at “Tabi-regi” provided by the Ministry of Foreign Affairs.</li></ol>					
<b>【Plan】</b>					
No.	Date	Contents	Preparing learning	Instructor	
1	Any time	They are supposed to plan and execute the programs based on a meeting with the foreign dental school	Make preliminary meetings thoroughly	Supervisors in Niigata/on-	



		or intuition.		site
<p><b>【Evaluation】</b></p> <p>The instructor of Niigata University will assess the evaluation of the instructors of the other party, a detailed report of the activities during the stay and self-evaluation of the stay. Then, upon approval by the Academic Affairs Committee of the Graduate School of Medical and Dental sciences (Dental), a course credit will be given to the participant.</p> <p><b>【Media】</b></p> <p>Scientific papers and others would be indicated if necessary.</p> <p><b>【Reference book】</b></p> <p>Literatures would be indicated if necessary.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5149	1 or 2	Flexible	4	9214	Practice
Course	Extramural Externship				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	According to the details of PhD candidate's externship programme				
I・II	<p><b>【Course outline】</b></p> <p>A practice-based training as a global oral health team leader in assimilating and applying related sciences &amp; technologies in the promotion of oral health of the global citizen covering scopes of global oral health concern in a real situation in developing countries or marginalized population where global oral health in terms of inequality and disparity exists including translation of oral health sciences into the population and global application to improve oral health taking into account of social and economic determinants at all levels from individual tooth to global level or vice versa. The training will be in collaboration with education institutes in a selected country.</p> <p><b>【Course aim】</b></p> <p>The extramural externship will provide at least three mutual benefits among the associated parties.</p> <ol style="list-style-type: none"> <li>1. Student: Apply global oral health knowledge taught in class into practice in the community, develop skills and extend experience in the actual world of global oral health burdens.</li> <li>2. Community: Working with the Site supervisor at the neighborhood collaborating institutions to improve the oral health and general health of the community through services provided by the future global oral health workforce.</li> <li>3. Neighborhood Collaborating Institution: Nurture a close relationship between the Niigata University Division of Preventive Dentistry, the faculty, the extramural externship setting, students and the community.</li> </ol> <p><b>【Attainment target】</b></p> <p>The students are required to establish an extramural project, plan or scope of work based upon the community's needs, work, or institutional mission. The project should include externship location, date and period, list of works to be done and achieved, travelling plan, proposed budget and possible financial support.</p> <ol style="list-style-type: none"> <li>1. Main learning outcomes of the extramural externship will allow the student a significant chance to utilize knowledge and skills from the classroom to real setting where global oral health burdens in terms of inequality and disparity exists in the followings.</li> <li>2. Plans for developing or improving the extramural externship experience activities.</li> </ol> <p><b>【Study method・attention】</b></p> <ol style="list-style-type: none"> <li>1. The extramural externship training will occur when:</li> <li>2. Organizational structure</li> <li>3. Student Activities</li> <li>4. Student Assignments or</li> <li>5. Follow up Activities with Students</li> <li>6. Responsibilities of Supervising Staff in the extramural externship setting</li> <li>7. Responsibilities of the Course Director and Academic Advisor from the Niigata University</li> <li>8. Arrangements made for student guidance and support</li> <li>9. Facilities and support required at the extramural externship location</li> </ol> <p>Information and materials will be provided prior to the programme.</p>				

【Plan】				
No.	Date	Contents	Preparing learning	Instructor
1～15		According to the details of each student' s externship programme	Guidance will be provided accordingly	Supervisor in Niigata and Supervisor on-site
16		Report and presentation	Preparation for presentation	Supervisor in Niigata and Supervisor on-site
<p><b>【Evaluation】</b></p> <p>Methods of assessment:</p> <p>Self-evaluation/On-site observation/Logbook and portfolio/Conduct and behavior during the extramural externship period/Comments and feedback from community and stakeholders/Effectively giving an oral presentation to the local community and at the international scientific meeting.</p> <p><b>【Media】</b></p> <p>Textbooks will be indicated if required.</p> <p><b>【Reference book】</b></p> <p>References will be indicated if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5150	1 or 2	Flexible	1	9214	Seminar
Course	Dissertation Interim Presentation				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	According to the details of PhD candidate's externship programme				
I・II	<p><b>【Course outline】</b></p> <p>Candidates have to present their proposal and investigation as interim presentation.</p> <p><b>【Course aim】</b></p> <p>In this course, candidates should do as follows:</p> <ol style="list-style-type: none"><li>1. Evaluate data objectively</li><li>2. Summarize theoretically the purpose, material and method, results and consideration</li><li>3. Present their research to audience effectively at a congress</li></ol> <p><b>【Attainment target】</b></p> <p>To present positively the research of Global Oral Health Science</p> <p>To recognize circumstances of the research topic and needed contents through question and answer session</p> <p>To obtain more knowledge in order to improve the dissertation</p> <p><b>【Study method・attention】</b></p> <p>Candidates should undertake the coaching of presentation by their supervisors. They are also requested to present as a rehearsal at their department. Requested materials will be provided prior to every time.</p>				
<b>【Plan】</b>					
No.	Date	Contents	Preparing learning	Instructor	
1～15		<ol style="list-style-type: none"><li>1. Plan a schedule to present based on their research.</li><li>2. Consider the contents and make a presentation material.</li><li>3. Practice the presentation with their supervisor and colleagues.</li><li>4. Revise the contents/materials again if they are pointed out.</li><li>5. After presentation, re-consider whether they could explain the prepared contents sufficiently or not, and apply it to improve their research hereafter.</li><li>6. Have a good communication with involved people.</li></ol>	Guidance will be provided accordingly	OGAWA Hiroshi	
16		Presentation	Preparation for presentation	OGAWA Hiroshi	

**【Evaluation】**

Evaluated by performance included debates, assignments and presentations (80%), and attitude (20%).

**【Media】**

Textbooks will be indicated if required.

**【Reference book】**

References will be indicated if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5151	1 or 2	Flexible	1	9215	Seminar
Course	Dissertation Presentation of Global Oral Health Science at International Congress				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	According to the details of PhD candidate's externship programme				
I・II					
<b>【Course outline】</b> Candidates have to present their research at an international congress.					
<b>【Course aim】</b> In this course, candidates should obtain skills of presentation in order to express the research outcome properly at international congresses.					
<b>【Attainment target】</b> To present positively the research of Global Oral Health Science To recognize circumstances of the research topic and needed contents through question and answer session To obtain more knowledge in order to improve the dissertation To execute everything above in English					
<b>【Study method・attention】</b> Candidates should undertake the coaching of presentation by their supervisors. They are also requested to present as a rehearsal at their department. Requested materials will be provided prior to each study.					
<b>【Plan】</b>					
No.	Date	Contents	Preparing learning	Instructor	
1～15		1. Plan a schedule to present based on their research. 2. Consider the contents and make a presentation material. 3. Practice the presentation with their supervisor and colleagues. 4. Revise the contents/materials again if they are pointed out. 5. After presentation, re-consider whether they could explain the prepared contents sufficiently or not, and apply it to improve their research hereafter. 6. Have a good communication with involved people.	Guidance will be provided accordingly	OGAWA Hiroshi	
16		Presentation	Preparation for presentation	OGAWA Hiroshi	

**【Evaluation】**

Evaluated by preparation for presentation, comprehension, debates, assignments and presentations.

**【Media】**

Textbooks will be indicated if required.

**【Reference book】**

References will be indicated if required.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5152	Year	Flexible	8	9214	Seminar
Course	Dissertation Proposal Development and Implementation for Global Oral Health Science				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	According to the details of PhD candidate’s externship programme				
<p><b>【Course outline】</b></p> <p>This course is designed to get started to make a dissertation. Candidates should make their proposal and undertake defense. After passing the proposal defense, candidates can start to implement their research.</p> <p><b>【Course aim】</b></p> <p>In this course, candidates will be able to make a research plan in Global Oral Health Science.</p> <p><b>【Attainment target】</b></p> <p>To make a research proposal contributing to Global Oral Health</p> <p>To implement the proposal with knowledge and methodology they obtained by coursework subjects</p> <p>To utilize overseas resource and collaboration when needed</p> <p><b>【Study method・attention】</b></p> <p>Candidates should be guided by supervisors when they get started to make a research proposal. When they complete, they have to undertake the proposal defense at the Graduate Study Administrative Committee in the Division of Preventive Dentistry. Research materials will be provided prior to each study.</p>					
I		【Plan】			
No.	Date	Contents	Preparing learning		Instructor
1～15		Design of study proposal for the thesis of PhD. The validity of the proposal is considered at the point of view as follows: ✓ To be based on previous studies ✓ To have academic significance, novelty, creativity and applicability To contribute to the candidate’s discipline and related disciplines	Guidance will be provided accordingly		OGAWA Hiroshi
16		Summary	Review the course		OGAWA Hiroshi
II		【Plan】			
No.	Date	Contents	Preparing learning		Instructor
1～15		The validity of the proposal is evaluated at the point of view as follows: ✓ To be based on previous studies ✓ To have academic significance, novelty, creativity and applicability	Guidance will be provided accordingly		OGAWA Hiroshi



		To contribute to the candidate' s discipline and related disciplines		
16		Presentation Study will be implemented after the proposal is accepted	Prepare for presentation	OGAWA Hiroshi
<p><b>【Evaluation】</b>  Evaluated by performance included debates, assignments and presentations (80%), and attitude (20%).</p> <p><b>【Media】</b>  Textbooks will be indicated if required.</p> <p><b>【Reference book】</b>  References will be indicated if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5153	2	Flexible	4	9215	Seminar
Course	Dissertation defense (Global Oral Health Science)				
Instructor	Prof. OGAWA Hiroshi (Div. Preventive Dentistry)				
Place	According to the details of PhD candidate’s externship programme				
I・II					
<b>【Course outline】</b> Candidates should complete their dissertation regarding Global Oral Health Science, submit and undertake their defenses.					
<b>【Course aim】</b> In this course, candidates should complete their dissertation on the purpose of the graduation for PhD course of Global Oral Health Science.					
<b>【Attainment target】</b> Candidates are able to integrate all the data obtained by investigation, knowledge acquired by didactic courseworks, experiences by externship, discussion of Q and A session at interim presentation and international congress presentation and accomplish their dissertation.					
<b>【Study method・attention】</b> Candidates should undertake the coaching of writing their dissertation by their supervisors. Requested materials will be provided prior to every time. When completed, candidates submit it and apply for the defense in accordance with the regulation of final thesis defense.					
<b>【Plan】</b>					
No.	Date	Contents	Preparing learning	Instructor	
1～15		At the final thesis defense, candidates are evaluated as follows: ✓ Research methodology and main thesis: ✓ Selected appropriate methods based on previous studies ✓ Described materials and methods clearly/specifically ✓ Searched, read and evaluated previous investigation and related papers sufficiently/precisely ✓ Collected, analyzed and interpreted data adequately ✓ Explicated the results, analysis and consideration theoretically/convincingly  Academic Importance of the research: ✓ To have originality and novel perception	Guidance will be provided accordingly	OGAWA Hiroshi	

		<ul style="list-style-type: none"> <li>✓ To be verified sufficiently</li> <li>✓ To be considered how to deal with unclear questions</li> <li>✓ To contribute to education, research and clinical work</li> </ul> <p>Construction of the dissertation:</p> <ul style="list-style-type: none"> <li>✓ To have sufficient format and volume fitting the topic</li> </ul> <p>To be designed appropriately to submit for scientific journals with exact grammar, words and clear expression</p>		
16		Presentation	Preparation for presentation	OGAWA Hiroshi
<p><b>【Evaluation】</b>  Evaluated by preparation for presentation, comprehension, debates, assignments and presentations.</p> <p><b>【Media】</b>  Textbooks will be indicated if required.</p> <p><b>【Reference book】</b>  References will be indicated if required.</p>				

## Department of Oral Biological Science

## Department of Oral Biological Science

Course	Page
Oral and Maxillofacial Anatomy IA, IIA, IB, IIB	195
Oral and Maxillofacial Anatomy Seminar IA, IIA, IB, IIB	198
Orofacial motor function IA, IIA, IB, IIB	202
Basic Neuroscience IA, IIA, IB, IIB	206
Advanced lecture on Molecular Neurobiology IA, IIA, IB, IIB	209
Dentofacial Orthodontics IA, IIA, IB, IIB	213
Seminar on clinical orthodontics IA, IIA, IB, IIB	216
Seminar for clinical orthodontic treatments IA, IIA, IB, IIB	219
Dysphagia Rehabilitation IA, IIA, IB, IIB	222
Assessment of Dysphagia IA, IIA, IB, IIB	225
Seminar on Evaluation of Feeding Function IA, IIA, IB, IIB	229
Periodontal Therapy IA, IIA, IB, IIB	232
Periodontal Regenerative Therapy IA, IIA, IB, IIB	236
Seminar for Periodontal therapy IA, IIA, IB, IIB	240
Infection control and restoration of tissue integrity IA, IIA, IB, IIB	244
Seminar on Diagnosis of Periodontitis IA, IIA, IB, IIB	247

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5301	1	Tue/4・IA	2	9014	Lecture/Seminar
230N5303		Tue/5・IIA			
230N5302	2	Tue/4・IB	2	9015	Lecture/Seminar
230N5304		Tue/5・IIB			
Course	Oral and Maxillofacial Anatomy IA, IIA, IB, IIB				
Instructor	Prof. Takeyasu Maeda				
Place	Wing C 6F Room C611				
IA・IIA					
<b>【Course outline】</b> This course deals with normal structure and development of human organs in orofacial region from the macro- and microscopic and cell biological viewpoints.					
<b>【Course aim】</b> By explaining the complex structure in orofacial region from its developmental aspect, the students will be able to understand that the delicate and complex functions of orofacial region can be achieved by coordination of each structure.					
<b>【Attainment target】</b> The students can explain the normal structure and developmental process of orofacial region from the of macroscopic and microscopic levels.					
<b>【Study method・attention】</b> Before this class, the students are requested to read through the designated pages and handouts. In principle, lectures/seminar are given face-to-face. However, depending on the spread of COVID19 infection, lecture style may be changed to real-time online style using a Zoom.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance & introduction	p. 2-9		Takeyasu Maeda
2	4/18	Normal development of orofacial organs	p. 10-35		Takeyasu Maeda
3	4/25	↓	p. 10-35		Takeyasu Maeda
4	5/2	↓	p. 10-35		Takeyasu Maeda
5	5/9	Bone morphometry of orofacial region	p. 306-355		Takeyasu Maeda
6	5/16	↓	p. 306-355		Takeyasu Maeda
7	5/23	↓	p. 306-355		Takeyasu Maeda
8	5/30	Circulation and nervous systems of orofacial region	p. 187-225		Takeyasu Maeda

9	6/6	↓	p. 187-225	Takeyasu Maeda
10	6/13	↓	p. 187-225	Takeyasu Maeda
11	6/20	Splanchnology of orofacial region	p. 264-305	Takeyasu Maeda
12	6/27	↓	p. 264-305	Takeyasu Maeda
13	7/4	Structure and ultrastructure of tooth and oral cavity	p. 38-186	Takeyasu Maeda
14	7/11	↓	p. 38-186	Takeyasu Maeda
15	7/18	↓	p. 38-186	Takeyasu Maeda
16	7/25	Examination		Takeyasu Maeda

#### 【Evaluation】

Oral examination (80%), class attitude (20%).

#### 【Media】

Oral Histology and Embryology 2<sup>nd</sup> eds (Ishiyaku Publisher Co.) 11,000 Yen (+tax)

#### 【Reference book】

Oral Anatomy 2<sup>nd</sup> eds (Ishiyaku Publisher Co.) 11,000 Yen (+tax)

Netter's Head and Neck Anatomy for Dentistry, 3<sup>rd</sup> ed. (Ishiyaku Publisher Co.) 12,000 Yen (+tax)

Related papers will be provided prior to lecture.

#### IB・IIB

#### 【Course outline】

This course provides topographical anatomical knowledge, and deals with tissue reactions to dental and/or surgical treatments in orofacial regions.

#### 【Course aim】

The students will be able to understand tissue repair and regeneration mechanisms for clinical procedures in dentistry.

#### 【Attainment target】

The students can explain the tissue repair and regeneration processes of orofacial region from the microscopic view.

#### 【Study method・attention】

Before this class, the students are requested to read through the designated pages and handouts. In principle, lectures/seminar are given face-to-face. However, depending on the spread of COVID19 infection, lecture style may be changed to real-time online style using a Zoom.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance & introduction	p. 2-9	Takeyasu Maeda
2	10/10	Mechanism of development/regeneration in nervous system	Related papers	Takeyasu Maeda
3	10/17	↓	Related papers	Takeyasu Maeda

4	10/24	Mechanism of development/regeneration in nervous system	p. 10-35, 187-225	Takeyasu Maeda
5	10/31	↓	p. 10-35, 187-225	Takeyasu Maeda
6	11/7	Plasticity of nerve fibers in pulp and periodontal ligament	p. 187-225	Takeyasu Maeda
7	11/14	↓	p. 187-225	Takeyasu Maeda
8	11/21	Mechanism of regeneration of hard tissue	p. 306-355	Takeyasu Maeda
9	11/28	↓	p. 306-355	Takeyasu Maeda
10	12/5	Cell biology of temporomandibular joint ↓	p. 237-263	Takeyasu Maeda
11	12/12	Pathophysiology of temporomandibular joint	p. 237-263	Takeyasu Maeda
12	12/19	↓	p. 237-263	Takeyasu Maeda
13	12/26	Tissue reactions to dental implant	p. 306-355	Takeyasu Maeda
14	1/16	↓	p. 306-355	Takeyasu Maeda
15	1/23	↓	p. 306-355	Takeyasu Maeda
16	1/30	Examination		Takeyasu Maeda

**【Evaluation】**

Oral examination (80%), class attitude (20%).

**【Media】**

Oral Histology and Embryology 2<sup>nd</sup> eds (Ishiyaku Publisher Co.) 11,000 Yen (+tax)

**【Reference book】**

Oral Anatomy 2<sup>nd</sup> eds (Ishiyaku Publisher Co.) 11,000 Yen (+tax)

Netter' s Head and Neck Anatomy for Dentistry, 3<sup>rd</sup> ed. (Ishiyaku Publisher Co.) 12,000 Yen (+tax)

Related papers will be provided prior to lecture.



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5305	1	Thu／ 2 ・ IA	2	9014	Lecture ・ Practice
230N5307		Thu／ 7 ・ IIA			
230N5306	2	Thu／ 2 ・ IB	2	9014	Lecture ・ Practice
230N5308		Thu／ 7 ・ IIB			
Course	Oral and Maxillofacial Anatomy Seminar IA, IIA, IB, IIB				
Instructor	Prof. Atsushi Ohazama (Div. Oral Anatomy) Assoc. Prof. Maiko Kawasaki (Div. Oral Anatomy) Assist. Prof. Katsushige Kawasaki (Ctr. Advanced Oral Science)				
Place	Oran Anatomy Lab				
IA ・ IIA					
<b>【Course outline】</b> This course performs standard molecular biological analyses requires for understanding normal structures and functions of orofacial organs. <b>【Course aim】</b> The students acquire updated skills of morphological analyses by using flow cytometer and confocal laser microscope. <b>【Attainment target】</b> Student can understand how flow cytometer functions and operate the equipment. Student can perform confocal laser microscopic analysis. Student can perform laser microdissection analysis. <b>【Study method・attention】</b> Handout will be provided in advance.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	April 6	Introduction	Details will be given in class.		Atsushi Ohazama
2	April 13	Molecular analysis of orofacial tissues	Details will be given in class.		Atsushi Ohazama
3	April 20	Molecular analysis of periodontal ligament tissues	Details will be given in class.		Atsushi Ohazama
4	April 27	Molecular analysis of cementum tissues	Details will be given in class.		Atsushi Ohazama
5	May 11	Molecular analysis of orofacial bone	Details will be given in class.		Maiko Kawasaki
6	May 18	Molecular analysis of oral mucosal tissues	Details will be given		Katsushige

			in class.	Kawasaki
7	May 25	Molecular analysis of salivary gland	Details will be given in class.	Atsushi Ohazama
8	June 1	Molecular analysis of skeletal muscle	Details will be given in class.	Atsushi Ohazama
9	June 8	Molecular analysis of dental pulp	Details will be given in class.	Maiko Kawasaki
10	June 15	Molecular analysis of nerve tissues	Details will be given in class.	Maiko Kawasaki
11	June 22	Molecular analysis of gingival tissues	Details will be given in class.	Katsushige Kawasaki
12	June 29	Molecular analysis of salivary glands	Details will be given in class.	Katsushige Kawasaki
13	July 6	Molecular analysis of junctional epithelium	Details will be given in class.	Atsushi Ohazama
14	July 13	Molecular analysis of tongue	Details will be given in class.	Atsushi Ohazama
15	July 20	Discussion	Details will be given in class.	Atsushi Ohazama
16	July 27	Summary and Examination	Details will be given in class.	Atsushi Ohazama, Maiko Kawasaki, Katsushige Kawasaki
<p><b>【Evaluation】</b>  Oral examination (100%)</p> <p><b>【Media】</b>  A Manual of Histologic Preparation edited by Div. Oral Anatomy</p> <p><b>【Reference book】</b>  We provide research papers if required.</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b>  This course introduces the essential knowledge on molecular mechanisms of craniofacial development including current research trend and methodology.</p> <p><b>【Course aim】</b>  Students acquire the knowledge on molecular developmental biology, which is essential to understand prospective regenerative therapy.</p>				

<p><b>【Attainment target】</b></p> <p>Student can understand the molecular mechanisms of craniofacial development</p> <p>Student can explain the fundamental mechanisms on organ culture techniques</p> <p>Student can understand the basic skills on molecular biology</p> <p><b>【Study method・attention】</b></p> <p>The instruction will be done by the procedure indicated by our original text. Text will be provided in advance.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	October 5	Overview	Details will be given in class.	Atsushi Ohazama
2	October 12	Neural crest-derived cells	Details will be given in class.	Atsushi Ohazama
3	October 19	Epithelial-mesenchymal interaction	Details will be given in class.	Atsushi Ohazama
4	October 26	Molecular mechanisms of tooth development	Details will be given in class.	Atsushi Ohazama
5	November 2	Molecular mechanisms of eyelid development	Details will be given in class.	Katsushige Kawasaki
6	November 9	Molecular mechanisms of hair development	Details will be given in class.	Atsushi Ohazama
7	November 16	Molecular mechanisms of palate development	Details will be given in class.	Maiko Kawasaki
8	November 30	Molecular mechanisms of lip development	Details will be given in class.	Atsushi Ohazama
9	December 7	Molecular mechanisms of tongue development	Details will be given in class.	Maiko Kawasaki
10	December 14	Trowell-type organ culture technique	Details will be given in class.	Katsushige Kawasaki
11	December 21	Whole embryo culture by rolling culture bottle system	Details will be given in class.	Atsushi Ohazama
12	January 11	Sliced tissue culture technique	Details will be given in class.	Maiko Kawasaki
13	January 18	Organ culture experiments using transgenic mice	Details will be given in class.	Katsushige Kawasaki
14	January 25	Discussion	Details will be given in class.	Atsushi Ohazama

15	February 1	Discussion	Details will be given in class.	Atsushi Ohazama
16	February 8	Summary and Examination	Details will be given in class.	Atsushi Ohazama, Maiko Kawasaki, Katsushige Kawasaki
<p><b>【Evaluation】</b> Oral examination (100%)</p> <p><b>【Media】</b> A Manual of Histologic Preparation edited by Div. Oral Anatomy</p> <p><b>【Reference book】</b> We provide research papers if required.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5309	1	Wed/2・I A	2	9014	Lecture・Seminar・Practice
230N5311		Wed/6・II A			
230N5310	2	Wed/2・I B	2	9014	Lecture・Seminar・Practice
230N5312		Wed/6・II B			
Course	Orofacial motor function IA, IIA, IB, IIB				
Instructor	Prof. Kensuke Yamamura (Div. Oral Physiology)				
Place	Laboratory of Oral Physiology				
IA・IIA					
【Course outline】 Technological innovation in bioelectric measurements enabled us to easily record various bioelectric signals, and such method (e.g. electromyogram: EMG) is frequently used in clinical studies as well as basic researches. On the other hand, many young researchers need advice for proper recording, proper signal processing, and proper interpretation of data. In the first semester, we study fundamental knowledge of bodily motor function on the viewpoints of kinesiology and neuroscience. We also learn techniques of EMG recordings.					
【Course aim】 The aim of this course is to obtain fundamental knowledge of motor function, and learn how to record electromyograms.					
【Attainment target】 ● Correlate the structures of orofacial motor organs with their motor function. ● Explain differences between voluntary and semiautomatic movements. ● Explain neural regulatory mechanisms of muscle contraction force. ● Explain how to record and analyze electromyograms. ● Perform EMG recordings properly.					
【Study method・attention】 Seminar and/or discussion style is employed. Students require sufficient preparations prior to each lecture. Although the face to face seminar is held; however, the on-line lecture/seminar (real time) with the Zoom could be possible when necessary.					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/12	Guidance		N. A.	Yamamura
2	4/19	Kinesiology of orofacial motor function (lecture)		Organizing the main points of the materials distributed at the class	Yamamura
3, 4	4/26 5/10	Kinesiology of orofacial motor function (article reading)		Read the research article introduced at the class	Yamamura

5	5/17	Voluntary and semiautomatic movements (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
6, 7	5/24 5/31	Voluntary and semiautomatic movements (article reading)	Read the research article introduced at the class	Yamamura
8	6/7	Regulatory mechanisms of muscle contraction force. (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
9, 10	6/14 6/21	Regulatory mechanisms of muscle contraction force (reading)	Read the research article introduced at the class	Yamamura
11	6/28	How to record electromyogram (EMG) (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
12	7/5	How to record electromyogram (EMG) (practice)	Review of previous class	Yamamura
13	7/12	Waveform processing to reduce noise (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
14	7/19	Waveform processing to reduce noise (practice)	Review of previous class	Yamamura
15	7/26	Conclusion and discussion	Review of previous classes	Yamamura
16	8/2	Examination	Review of previous classes	Yamamura

**【Evaluation】**

Report and Examination (50%), Observation record during reading and experiment (50%). The oral examination is conducted by face to face with the instructor.

**【Media】**

N. A.

**【Reference book】**

Neil R. Carlson, Physiology of Behavior 11th edition (Pearson, 2013) ISBN-13: 978-0205239399

IB • IIB

**【Course outline】**

In the second semester, we focus on orofacial motor functions. For mandibular movement, tongue movement,

facial movements and masticatory movement, lectures are given from the viewpoint of kinematics and neurology. Then students enhance understanding by reading recent papers. Students also learn techniques of EMG recordings and analytic methods of EMG data during mastication.

**【Course aim】**

The aim of this course is to understand orofacial motor function on the viewpoints of kinesiology and neuroscience too study orofacial motor function and its regulatory mechanisms.

**【Attainment target】**

- Explain neural control mechanisms of jaw movements.
- Explain neural control mechanisms of tongue and facial movements.
- Explain neural control mechanisms of masticatory movements.
- Perform EMG recordings and analysis of data during orofacial voluntary movements.
- Perform EMG recordings and analysis of data during mastication.

**【Study method・attention】**

Seminar and/or discussion style is employed. Students require sufficient preparations prior to each lecture. Although the face to face seminar is held; however, the on-line lecture/seminar (real time) with the Zoom could be possible when necessary.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	N. A.	Yamamura
2	10/11	Neural control mechanisms of jaw movements (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
3, 4	10/18 10/25	Neural control mechanisms of jaw movements (reading)	Read the research article introduced at the class	Yamamura
5	11/1	Neural control mechanisms of tongue and facial movements (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
6, 7	11/8 11/15	Neural control mechanisms of tongue and facial movements (reading)	Read the research article introduced at the class	Yamamura
8	11/29	Neural control mechanisms of masticatory movements (lecture)	Organizing the main points of the materials distributed at the class	Yamamura
9, 10	12/6 12/13	Neural control mechanisms of masticatory movements (reading)	Read the research article introduced at the class	Yamamura

11, 12	12/20 1/10	Electromyographic recording and analysis of orofacial voluntary movements(experiment)	Review of previous classes	Yamamura
13, 14	1/17 1/24	Electromyographic recording and analysis of masticatory movement (experiment)	Review of previous classes	Yamamura
15	1/31	Conclusion and discussion	Review of previous classes	Yamamura
16	2/7	Examination	Review of previous classes	Yamamura

**【Evaluation】**

Report and Examination (50%), Observation record during reading and experiment (50%). The oral examination is conducted by face to face with the instructor.

**【Media】**

N. A

**【Reference book】**

Neil R. Carlson, Physiology of Behavior 11th edition (Pearson, 2013) ISBN-13: 978-0205239399



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5313	2	Tue/4 IA	2	9014	Lecture, Seminar
230N5315		Tue/6 IIA			
230N5314	2	Tue/4 IB	2	9015	Lecture, Seminar
230N5316		Tue/6 IIB			
Course	Basic Neuroscience IA, IIA, IB, IIB				
Instructor	Associate Prof. Keiichiro Okamoto (Div. Oral Physiology)				
Place	Laboratory of Oral Physiology (E513)				
IA・IIA					
【Course outline】 Human body has various functions to react and adapt the changes of external and internal environmental changes to maintain homeostasis. Peripheral and central nervous systems appear to play critical roles on it. This course presents overview of the fundamental mechanisms for the nervous systems that could involve the regulation of body functions. Students can learn basic mechanisms of peripheral and central nervous systems that regulate physiological functions through this seminar and scientific articles.					
【Course aim】 The aims of this seminar include several issues to learn fundamental knowledge of neuroscience such as function of central and peripheral nervous systems and basic experimental methodology for neuroscience research.					
【Attainment target】 1. Explain the significant reason why we have various physiological function in a body 2. Explain the technical terms used in the field of neuroscience 3. Explain the basic theory including Action Potential and Synaptic Function in English. 4. Explain the methodologies to record and visualize neural excitability. Explain the significant reason why we have various physiological function in a body 5. Explain the technical terms used in the field of neuroscience 6. Explain the basic theory including Action Potential and Synaptic Function in English. 7. Explain the methodologies to record and visualize neural excitability.					
【Study method・attention】 Seminar and/or discussion style is employed. Students require sufficient preparations prior to each lecture. Although the face to face seminar is held; however, the on-line lecture/seminar (real time) through the Zoom could be possible when necessary.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance and Introduction of neuroscience.	N/A		Okamoto
2, 3	4/18 4/25	Neuron, Glia Cell.	Text① p22-49		Okamoto
4, 5	5/2 5/9	How to know Action Potential (1)	Text① p73-97		Okamoto

6, 7	5/16 5/23	Resting, Action Potential 1, 2	Text① p50-72	Okamoto
8, 9	5/30, 6/6	How to know Action Potential (2)	Text① p73-97	Okamoto
10	6/13	Discussion, Present their knowledge that students learned in 9 seminar series	Discussion after Oral presentation	Okamoto
11, 12	6/20, 6/27	Synapse 1, 2	Text① p98-129	Okamoto
13, 14	7/4, 7/11	Receptors 1, 2	Text① p130-162	Okamoto
15	7/18	Discussion, Present their knowledges that students learned in all seminar series.	Discussion after Oral presentation	Okamoto
16	7/25	Examination	Oral examination	Okamoto

#### 【Evaluation】

Report and oral examination (90%), Discussion and debate at the seminar (10%). The oral examination is conducted by face to face with the instructor.

#### 【Media】

Text①、Neuroscience Exploring the Brain 2<sup>nd</sup> Edition、Bear et al. 7600 円 ISBN 0-7817-3944-6.

#### 【Reference book】

N/A

### IB・IIB

#### 【Course outline】

In the 2<sup>nd</sup> semester, students will learn neuroscience much deeper and more specifically. As learned in the 1<sup>st</sup> semester, homeostasis is maintained by various physiological functions in the body, and sensory processing plays critical roles in it. This seminar will focus on the basis for the somatosensory processing in the peripheral and central nervous systems. Emphasis is directed on the study of pain processing, especially chronic pain conditions, since treatment for chronic pain appeared to be hard that could be due to less understanding of the basic mechanisms, clinically. Students will learn the pain mechanisms from the aspects of brain function.

#### 【Course aim】

The main purpose of this seminar is to understand and explain the neural mechanisms underlying pain conditions.

#### 【Attainment target】

1. Explain basic mechanisms underlying pain conditions.
2. Explain the differences between acute and chronic pain.
3. Explain neural mechanisms for orofacial pain.
4. Explain several factors that influences pain responses.

#### 【Study method・attention】

Seminar and/or discussion style is employed. Students require sufficient preparations prior to each lecture. Although the face to face seminar is held; however, the on-line lecture/seminar (real time) with the Zoom could be possible when necessary.

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance.	N/A	Okamoto
2	10/10	Somatosensory system, brain pathways.	Paper being provided.	Okamoto
3	10/17	Pain (Peripheral mechanism)	Paper being provided. Text② p3-34.	Okamoto
4	10/24	Pain (Spinal, trigeminal caudalis mechanism)	Paper being provided. Text② p73-89.	Okamoto
5	10/31	Pain (Plastic changes in the dorsal horn)	Paper being provided. Text② p91-105.	Okamoto
6	11/7	Pain (Descending pain controls)	Paper being provided. Text② p125-142.	Okamoto
7	11/14	Discussion and presentation	Paper being provided.	Okamoto
8	11/21	Basis for Inflammatory pain, and neuropathic pain.	Paper being provided. Text② p49-72.	Okamoto
9	11/28	Pain conditions in the trigeminal areas	Paper being provided.	Okamoto
10	12/5	Pain (trigeminal root ganglion, trigeminal subnucleus caudalis)	Paper being provided.	Okamoto
11	12/12	Basis for headache and dry eye syndrome	Paper being provided. Text② p833-850.	Okamoto
12	12/19	Basis for temporomandibular joint disorder (TMD) and stress conditions	Paper being provided.	Okamoto
13	12/26	Basis for TMD and sex steroids	Paper being provided. Text② p1181-1198.	Okamoto
14	1/16	Reading papers about pain mechanisms in the trigeminal area	Paper being provided.	Okamoto
15	1/23	Discussion	Discussion after Oral presentation	Okamoto
16	1/30	Examination	Oral examination	Okamoto
<p><b>【Evaluation】</b>  Report and oral examination (90%), Discussion and debate at the seminar (10%). The oral examination is conducted by face to face with the instructor.</p> <p><b>【Media】</b>  Text② Textbook of Pain by Stephen McMahon and Martin Koltzenburg, Elseviere (5<sup>th</sup>),, ISBN13: 978-0702040597, 19, 121 円。</p> <p><b>【Reference book】</b>  N/A</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5317	1	Tue/6・IA	2	9014	Practice
230N5319		Tue/7・IIA			
230N5318	2	Tue/6・IB	2	9014	Practice
230N5320		Tue/7・IIB			
Course	Advanced lecture on Molecular Neurobiology IA, IIA, IB, IIB				
Instructor	Prof. Miho Terunuma (Div. Oral Biochemistry)				
Place	Laboratory of Oral Biochemistry				
IA・IIA					
<b>【Course outline】</b> This course aims to provide you with the foundational knowledge that you will need in basic neuroscience and neurobiology. In semester 1, the molecular and cellular mechanisms in the organization and functions of the central nervous system will be discussed.					
<b>【Course aim】</b> Students will perform various research techniques in neurobiology using primary cultured neurons/glial cells and brain slices.					
<b>【Attainment target】</b> Students will be able to: <ul style="list-style-type: none"><li>• Prepare primary cultured neurons/glial cells from rodents.</li><li>• Examine the localization and function of the molecules of interest.</li><li>• Analyze the data and correctly interpret the results.</li></ul>					
<b>【Study method・attention】</b> This class provides hands-on research experience. Handout will be provided at the beginning of each session.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	April 11	Introduction to Neurobiology	The details are instructed in the class.		Terunuma M
2	April 18	Preparation of primary cell culture	The details are instructed in the class.		Terunuma M
3	April 25	Primary culture (neuron)	The details are instructed in the class.		Terunuma M
4	May 2	Primary culture (astrocytes)	The details are instructed in the class.		Terunuma M

5	May 9	Transfection	The details are instructed in the class.	Terunuma M
6	May 16	Immunocytochemistry	The details are instructed in the class.	Terunuma M
7	May 23	Confocal microscopy	The details are instructed in the class.	Terunuma M
8	May 30	Fractionation	The details are instructed in the class.	Terunuma M
9	June 6	Preparation of cell lysates, protein assay	The details are instructed in the class.	Terunuma M
10	June 13	SDS-PAGE	The details are instructed in the class.	Terunuma M
11	June 20	Western blotting	The details are instructed in the class.	Terunuma M
12	June 27	↓	The details are instructed in the class.	Terunuma M
13	July 4	Data analysis	The details are instructed in the class.	Terunuma M
14	July 11	Data presentation	The details are instructed in the class.	Terunuma M
15	July 18	Summary of the program	The details are instructed in the class.	Terunuma M
16	July 25	Examination	The details are instructed in the class.	Terunuma M
<b>【Evaluation】</b> Attendance (60%), Report (40%)				

<p><b>【Media】</b> Neurobiology, Third Edition by Gordon M. Shepherd</p> <p><b>【Reference book】</b> Molecular Biology of the Cell, Sixth Edition</p>				
<p><b>IB • IIB</b></p> <p><b>【Course outline】</b> This course aims to provide you with the foundational knowledge that you will need in basic neuroscience and neurobiology. In semester 2, an up-to-date knowledge of the research methodology will be introduced.</p> <p><b>【Course aim】</b> Students will perform various research techniques in neurobiology using primary cultured neurons/glia cells and brain slices.</p> <p><b>【Attainment target】</b> Students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain post-translational modification and the way to analyze it.</li> <li>• Explain the methods of analyzing neuronal and non-neuronal activity</li> <li>• Explain the methods of detecting cellular death</li> <li>• Explain the techniques of examining protein trafficking</li> </ul> <p><b>【Study method・attention】</b> This class provides hands-on research experience. Handout will be provided at the beginning of each session.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Preparation and Review	Instructor
1	October 3	Techniques for studying post-translational modification	The details are instructed in the class.	Terunuma M
2	October 10	↓	The details are instructed in the class.	Terunuma M
3	October 17	↓	The details are instructed in the class.	Terunuma M
4	October 24	Techniques for studying cell activity (Calcium imaging)	The details are instructed in the class.	Terunuma M
5	October 31	↓	The details are instructed in the class.	Terunuma M
6	November 7	↓	The details are instructed in the class.	Terunuma M

7	November 14	Techniques for studying cell death	The details are instructed in the class.	Terunuma M
8	November 21	↓	The details are instructed in the class.	Terunuma M
9	November 28	↓	The details are instructed in the class.	Terunuma M
10	December 5	Techniques for studying protein trafficking	The details are instructed in the class.	Terunuma M
11	December 12	↓	The details are instructed in the class.	Terunuma M
12	December 19	↓	The details are instructed in the class.	Terunuma M
13	December 26	Data analysis	The details are instructed in the class.	Terunuma M
14	January 16	Data presentation	The details are instructed in the class.	Terunuma M
15	January 23	Summary of the program	The details are instructed in the class.	Terunuma M
16	January 30	Examination	The details are instructed in the class.	Terunuma M
<p><b>【Evaluation】</b>  Attendance (60%), Report (40%)</p> <p><b>【Media】</b>  Neurobiology, Third Edition by Gordon M. Shepherd</p> <p><b>【Reference book】</b>  Molecular Biology of the Cell, Sixth Edition</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5325	1	Fri/6 I A	2	9114	Lecture・Seminar
230N5327		Fri/6 II A			
230N5326	2	Fri/6 I B	2	9115	Lecture・Seminar
230N5328		Fri/6 II B			
Course	Dentofacial Orthodontics IA, IIA, IB, IIB				
Instructor	Prof. Isao Saito (Div. Orthodontics)				
Place	Seminar room for practice or cephalometric analysis, or orthodontic clinic				
IA・IIA					
<b>【Course outline】</b> This course will provide information on normal occlusion and etiology of dental/skeletal malocclusion. <b>【Course aim】</b> Basic knowledge of orthodontics will be provided to participant(s) for orthodontic analysis and diagnosis. <b>【Attainment target】</b> Participant(s) can: <ul style="list-style-type: none"><li>• Explain definition of normal occlusion</li><li>• Explain methods for cephalometric analysis</li><li>• Describe various types of malocclusion and their characteristics</li><li>• Diagnose various types of malocclusion and show adequate treatment plan in respective case</li></ul> <b>【Study method・attention】</b> Documents are supposed to be distributed before the beginning of each lecture. Participant(s) will be required to read the textbook and/or references designated before attending.					
<b>【Plan】</b>					
No.	Date	Contents	Preparation and Review		Instructor
1	4/7	Orientation	Read through distributed documents, and those related references		Saito
2	4/14, 4/21, 4/28	Normal occlusion	Read through distributed documents, and those related references		Saito
3	5/12, 5/19, 6/2, 6/9, 6/16	Etiology of malocclusion	Look through distributed materials for case analysis		Saito
4	6/23, 6/30, 7/7, 7/14,	Diagnosis of malocclusion	Look through distributed materials		Saito



	7/21, 7/28		for case analysis	
5	8/4	Exam (interview)	Arrangement and understanding of contents provided in the course	Saito
<p><b>【Evaluation】</b> The students will be evaluated by interviews (100%) for contents of the lecture provided.</p> <p><b>【Media】</b> The textbook of CONTEMPORARY ORTHODONTICS (5<sup>th</sup> edition; W. Proffit, ed., Mosby Year Book, Inc.) (15,108 yen including tax) and relevant papers in each content.</p> <p><b>【Reference book】</b> Stomatology: Totsuka Y and Takato, T Ed., Asakura publisher. (27,000 yen+tax) . The basic science and concepts of clinical orthodontics: Yogosawa Society of Orthodontists Ed., Quintessence publisher. (30,000 yen+tax)</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course will include etiology of dental/skeletal malocclusion, changes in dentofacial complex, and occlusion with orthodontic treatment. The differences in orthodontic treatment effects between individual cases will be also discussed.</p> <p><b>【Course aim】</b> Changes in craniofacial structure and occlusion during growth stage will be described, and the differences in orthodontic treatment effects on individual cases with various malocclusions will be mentioned.</p> <p><b>【Attainment target】</b> Participant(s) can:</p> <ul style="list-style-type: none"> <li>Summarize changes in craniofacial morphology during growth stage</li> <li>Explain treatment methods for various types of malocclusion</li> <li>Explain the differences in orthodontic treatment effects on individual cases</li> </ul> <p><b>【Study method・attention】</b> Documents are supposed to be distributed at the beginning of each lecture. Participant(s) will be required to read the textbook and/or references designated before attending.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Preparing learning	Instructor
1	10/13, 10/20, 10/27, 11/10, 11/17	Changes in dentofacial complex and occlusion with orthodontic treatment	Read through distributed documents, and those related references	Saito
2	11/24, 12/1, 12/8, 12/15, 12/22	Methods for orthodontic correction	Read through distributed documents, and those related references	Saito

3	1/12, 1/19, 1/26, 2/2	Presentation of various cases treated by orthodontic treatment alone or with orthognathic surgery	Look through distributed materials for case analysis	Saito
4	2/16	Overall discussion	Arrange problems pertaining to the course	Saito
5	3/1	Exam (interview)	Arrangement and understanding of contents provided in the course	Saito

**【Evaluation】**

The participant(s) will be evaluated by interviews (100%) for contents of the lecture provided and case analysis.

**【Media】**

The textbook of CONTEMPORARY ORTHODONTICS (5<sup>th</sup> edition; W. Proffit, ed., Mosby Year Book, Inc.) (15,108 yen including tax) and relevant papers in each content.

**【Reference book】**

Stomatology: Totsuka Y and Takato, T Ed., Asakura publisher. (27,000 yen+tax) .

Clinical Biomechanics on Tooth Movement-Dynamism of Bone and Periodontal Ligament: Shimono M. et al. Ed., Ishiyaku publisher (13,000 yen+tax) .

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5329	1	Thu/6 IA	2	IA/IIA	Lecture・Seminar
230N5331		Thu/7 IIA			
230N5330	2	Thu/6 IB	2	IB/IIB	Lecture・Seminar
230N5332		Thu/7 IIB			
Course	Seminar on clinical orthodontics IA, IIA, IB, IIB				
Instructor	Lecture Kojiro Takahashi				
Place	Seminar room of division of orthodontics				
IA・IIA					
【Course outline】 This course deals with the practice of orthodontic treatment.					
【Course aim】 This course provides fundamental knowledge and skill for basic orthodontic treatment.					
【Attainment target】 Participants can; Explain aim of orthodontic treatment Explain early orthodontic treatment Explain orthodontic treatment in permanent dentition					
【Study method・attention】 Participant(s) will be required to read the textbook and/or references designated before attending. This course format will be lecture/ seminar.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/13	Guidance	Details are indicated at the class.		Takahashi
2-4	4/20, 4/27, 5/11	Aim of orthodontic treatment	Textbook pp1-13, 31-39, 161-188		Takahashi
5-7	5/18, 5/25, 6/1	The first phase orthodontic treatment	Textbook pp189-205, 266-286		Takahashi
8-11	6/8, 6/15, 6/22, 6/29	Orthodontic treatment in permanent dentition 1	Textbook pp206-243, 266-286, 329-361		Takahashi
12-14	7/6, 7/13, 7/20	Orthodontic treatment in permanent dentition 2	Textbook pp363-410		Takahashi
15	7/27	Summary and Examination	Review until last time		Takahashi

<p><b>【Evaluation】</b>  The participants will be assessed by reports submitted (50%), interviews (40%) and their attitude during the class (10%).</p> <p><b>【Media】</b>  The basic science and concepts of clinical orthodontics: edited and written by Yogosawa orthodontic society, Quintessence (30,000 yen + Tax)</p> <p><b>【Reference book】</b>  Edgewise system Vol I: written by Fumio Yogosawa, Quintessence (42,000 yen + Tax)  Edgewise system Vol II: written by Fumio Yogosawa, Quintessence (45,000 yen + Tax)</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b>  This course deals with the practice of orthodontic treatment.</p> <p><b>【Course aim】</b>  This course provides skill for advanced orthodontic treatment.</p> <p><b>【Attainment target】</b>  Participants can;  Explain the surgical orthodontic treatment  Explain the role of orthodontist in interdisciplinary dentistry</p> <p><b>【Study method・attention】</b>  Participant(s) will be required to read the textbook and/or references designated before attending. The class format will be lecture/seminar.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5	Guidance	Details are indicated at the class.	Takahashi
2-4	10/12, 10/19, 10/26	The orthodontic treatment in cleft lip and/or palate	Textbook pp411-417	Takahashi
5-7	11/2, 11/9, 11/16	The surgical orthodontic treatment	Textbook pp421-427	Takahashi
8-11	11/30, 12/7, 12/14, 12/21	The orthodontic treatment in interdisciplinary dentistry 1	Textbook pp418-420, 428-433	Takahashi
12-14	1/11, 1/18, 1/25	The orthodontic treatment in interdisciplinary dentistry 2	Textbook pp434-440	Takahashi
15	2/8	Summary and Examination	Review until last time	Takahashi

**【Evaluation】**

The participants will be assessed by reports submitted (50%), interviews (40%) and their attitude during the class (10%).

**【Media】**

The basic science and concepts of clinical orthodontics: edited and written by Yogosawa orthodontic society, Quintessence (30,000 yen + Tax)

**【Reference book】**

Edgewise system Vol I: written by Fumio Yogosawa, Quintessence (42,000 yen + Tax)

Edgewise system Vol II: written by Fumio Yogosawa, Quintessence (45,000 yen + Tax)

Clinical Periodontology and Implant Dentistry, 4<sup>th</sup> edition: written by Jan Lindhe et al., Quintessence (27,000 yen + Tax)

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5365	1	Mon/6・IA	2	9114	Lecture
230N5367		Mon/7・IIA			
230N5366	2	Mon/6・IB	2	9115	Lecture
230N5368		Mon/7・IIB			
Course	Seminar for clinical orthodontic treatments IA, IIA, IB, IIB				
Instructor	Lecture Jun Nihara (Div. of Orthodontics)				
Place	Seminar room of division of orthodontics				
IA・IIA					
【Course outline】 This course deals with the physical and biomechanical topics for orthodontic treatment.					
【Course aim】 This course provides physical and biomechanical knowledge needed for orthodontic treatment.					
【Attainment target】 Participants can: Explain physical and biomechanical theory for orthodontic treatment. Explain effects of orthodontic appliances. Explain side effect of orthodontic appliances and management.					
【Study method・attention】 Lectures					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10	Guidance	Read references		Nihara
2	4/17	Principles of biomechanics	Read references		Nihara
3	4/24	Properties and structures of orthodontic wire materials	Read references		Nihara
4	5/1	How to select an archwire	Read references		Nihara
5	5/8	Anchorage and mechanics for orthodontic treatment	Read references		Nihara
6	5/15	Equilibrium	Read references		Nihara
7	5/22	The role of friction in orthodontic appliances	Read references		Nihara
8	5/29	3D concepts in tooth movement	Read references		Nihara
9	6/5	Stress, strain, and the biologic response	Read references		Nihara
10	6/12	Mechanics of Headgear	Read references		Nihara
11	6/19	Mechanics of maxillomandibular elastics	Read references		Nihara

12	6/26	Mechanics for overbite correction	Read references	Nihara
13	7/3	Mechanics of lingual arch	Read references	Nihara
14	7/10	Extraction therapies and space closure	Read references	Nihara
15	7/24	Biomechanics and treatment of dentofacial deformity	Read references	Nihara
16	7/31	Summary and Examination	Read references	Nihara

**【Evaluation】**

The participants will be assessed by reports submitted (50%), interviews (40%) and their attitude during the class (10%).

**【Media】**

Orthodontics: Current Principles and Techniques, 6th Edition: Lee Graber; 2016

Contemporary Orthodontics, 6<sup>th</sup> Edition: William Proffit, Mosby; 2018

**【Reference book】**

The Biomechanical Foundation of Clinical Orthodontics: Charles J. Burstone: Quintessence Pub Co;2015

**IB・IIB**

**【Course outline】**

This course deals with the physical and biomechanical topics for orthodontic treatment especially using orthodontic anchor screws(OAS).

**【Course aim】**

This course provides physical and biomechanical knowledge needed for orthodontic treatment with OAS following skills learned in course IA/IIA.

**【Attainment target】**

Participants can;

Explain physical and biomechanical theory for orthodontic treatment using OAS.

Explain effects of orthodontic appliances using OAS.

Explain side effect and management of orthodontic treatment using OAS.

**【Study method・attention】**

Lectures

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/2	Guidance	Read references	Nihara
2-4	10/16, 10/23, 10/30	Management in orthodontic treatment using OAS	Read references	Nihara
5-7	11/6, 11/13, 11/20	How to use OAS in treatment for maxillary protrusion case	Read references	Nihara
8-10	11/27, 12/4,	How to use OAS in treatment for mandibular protrusion case	Read references	Nihara

	12/11			
11-13	12/18, 12/25, 1/15	How to use OAS in treatment for openbite and deepbite case	Read references	Nihara
14-15	1/22, 1/29	How to use OAS in treatment for MTM case	Read references	Nihara
16	2/5	Summary and Examination	Read references	Nihara
<p><b>【Evaluation】</b> The participants will be assessed by reports submitted (50%), interviews (40%) and their attitude during the class (10%).</p> <p><b>【Media】</b> Case study of utilization technique with orthodontic anchor screw, Shigemi Goto et al, Ishiyaku Publishers, Inc., 2019</p> <p><b>【Reference book】</b> The Biomechanical Foundation of Clinical Orthodontics: Charles J. Burstone: Quintessence Pub Co;2015</p>				



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5333	1	Wed／1・IA	2	9114	Lecture
230N5335		Wed／6・IIA			
230N5334	2	Wed／1・IB	2	9115	Lecture
230N5336		Wed／6・IIB			
Course	Dysphagia Rehabilitation IA, IIA, IB, IIB				
Instructor	Prof. Makoto Inoue (Div. Dysphagia Rehabilitation)				
Place	Meeting room of Div. Dysphagia Rehabilitation				
IA・IIA					
<p>【Course outline】</p> <p>This course deals with aging change of orofacial function about ingestion. We discuss the diagnosis method in dysphasia that occurred by cerebral vascular disease or post operation of head neck cancer. Moreover, this course deals with medical system, social welfare, social security including care insurance for elderly.</p> <p>【Course aim】</p> <p>The course deals with the acquirement of knowledge for assessment and diagnose of dysphagia.</p> <p>【Attainment target】</p> <p>The student will appropriately explain the examination for evaluation of stomatognathic function.</p> <p>The students will select and perform the examination needed according to the purpose.</p> <p>【Study method・attention】</p> <p>The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/12	Guidance	Read handout before lecture	Makoto Inoue	
2	4/19, 26	Introduction	Read handout before lecture	Makoto Inoue	
3	5/10, 17	Screening test	Read handout before lecture	Makoto Inoue	
4	5/24, 31	Videofluorography	Read handout before lecture	Makoto Inoue	
5	6/7, 14	Videoendoscopy	Read handout before lecture	Makoto Inoue	
6	6/21, 28	EMG, manometry	Read handout before lecture	Makoto Inoue	

7	7/5, 12	EEG, MRI, NIRS	Read handout before lecture	Makoto Inoue
8	7/19, 26	Meal assessment	Read handout before lecture	Makoto Inoue
9	8/2	Summary and examination (possible, on remote)	Review all the contents	Makoto Inoue
<p><b>【Evaluation】</b>  Oral examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout if needed</p> <p><b>【Reference book】</b>  Dysphagia, Clinical management in adults and children (Elsevier)</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b>  This course deals with aging change of orofacial function about ingestion. We discuss the diagnosis method in dysphasia that occurred by cerebral vascular disease or post operation of head neck cancer. Moreover, this course deals with medical system, social welfare, social security including care insurance for elderly.</p> <p><b>【Course aim】</b>  The course deals with the acquirement of knowledge for assessment and diagnose of dysphagia.</p> <p><b>【Attainment target】</b>  The student will appropriately explain the examination for evaluation of stomatognathic function.  The students will select and perform the examination needed according to the purpose.</p> <p><b>【Study method・attention】</b>  The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	Read handout before lecture	Makoto Inoue
2	10/11, 18	Indirect therapy for orofacial and tongue muscles	Read handout before lecture	Makoto Inoue
3	10/25, 11/1	Indirect therapy for throat muscles	Read handout before lecture	Makoto Inoue
4	11/8, 15	Direct therapy (how we should select meal items)	Read handout before lecture	Makoto Inoue
5	11/22, 29	Direct therapy (swallowing maneuver)	Read handout before lecture	Makoto Inoue
6	12/6, 13	Oral care with thermal tactile stimulation	Read handout before	Makoto Inoue

			lecture	
7	12/20, 1/10	Environmental setting	Read handout before lecture	Makoto Inoue
8	1/17, 24	Surgery	Read handout before lecture	Makoto Inoue
9	1/31	Summary and examination (possible, on remote)	Review all the contents	Makoto Inoue
<p><b>【Evaluation】</b>  Oral examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout if needed</p> <p><b>【Reference book】</b>  Dysphagia, Clinical management in adults and children (Elsevier)</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5337	1	Fri／5・IA	2	9114	Lecture・Seminar
230N5339		Fri／7・IIA			
230N5338	2	Fri／5・IB	2	9115	Lecture・Seminar
230N5340		Fri／7・IIB			
Course	Assessment of Dysphagia IA, IIA, IB, IIB				
Instructor	Associate Prof. Takanori Tsujimura				
Place	Laboratory of Div. Dysphagia Rehabilitation				
IA・IIA					
<p>【Course outline】</p> <p>The appropriate method for swallowing function should be selected, since the many organs including tongue, larynx, and muscles should work coordinately for normal swallowing. The course deals with the methodology for assessment of various organs related with swallowing.</p> <p>【Course aim】</p> <p>The course is designed to master the knowledge and technique for assessment of swallow related organs which required for diagnosis of dysphagia.</p> <p>【Attainment target】</p> <p>The students will correctly understand physiology of related organs.</p> <p>The students will appropriately explain the examination for evaluation of stomatognathic function.</p> <p>The students will select and perform the examination needed according to the purpose.</p> <p>The students will list the needful examination according to the possible malfunction of mastication and swallowing.</p> <p>【Study method・attention】</p> <p>The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.</p>					
【Plan】					
No.	Date	Contents		Preparation and Review	Instructor
1	4/7	Introduction		The students have to read distributed materials for a lecture	Tsujimura
2	4/14	Property of various sensors		The students have to read distributed materials for a lecture	Tsujimura
3	4/21	Assessment of tongue movement		The students have to read distributed materials for a	Tsujimura

			lecture	
4-5	4/28 5/12	Measurement of tongue pressure	The students have to read distributed materials for a lecture	Tsujimura
6-7	5/19 5/26	Measurement with manometry	The students have to read distributed materials for a lecture	Tsujimura
8-9	6/2 6/9	Assessment of laryngeal movement	The students have to read distributed materials for a lecture	Tsujimura
10-11	6/16 6/23	Motion capture	The students have to read distributed materials for a lecture	Tsujimura
12-13	6/30 7/7	Assessment of coordination of related organs	The students have to read distributed materials for a lecture	Tsujimura
14-15	7/14 7/21	Simultaneous recording and analysis	The students have to read distributed materials for a lecture	Tsujimura
16	7/28	Summary and examination (possible, on remote)	The students have to read distributed materials for a lecture	Tsujimura
<p><b>【Evaluation】</b> Oral test or written examination (50%) and report (50%).</p> <p><b>【Media】</b> Handout supplied by Div. Dysphagia Rehabilitation</p> <p><b>【Reference book】</b> Research papers will be provided if needed.</p>				
IB・IIB				
<p><b>【Course outline】</b> The appropriate method for swallowing function should be selected, since the many organs including tongue, larynx, and muscles should work coordinately for normal swallowing. The course deals with the methodology for clinical assessment using case example.</p>				

<p><b>【Course aim】</b>  The course is designed to master the clinical knowledge and technique for diagnosis of dysphagia using result of actual clinical test.</p> <p><b>【Attainment target】</b>  The students will assess swallowing function and diagnose dysphagia using case example.  The students will list the needful examination according to the possible malfunction of mastication and swallowing.</p> <p><b>【Study method・attention】</b>  The students have to do a preparation for a lecture using textbooks or any source materials needed. Full contents the students have to prepare in each time will be supplied at the first time.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Preparation and Review	Instructor
1	10/6	Introduction	The students have to read distributed materials for a lecture	Tsujimura
2-3	10/13 10/20	Screening test	The students have to read distributed materials for a lecture	Tsujimura
4-5	10/27 11/10	Videofluorography	The students have to read distributed materials for a lecture	Tsujimura
6-7	11/17 11/24	Videoendoscopy	The students have to read distributed materials for a lecture	Tsujimura
8-9	12/1 12/8	Assessment of rehabilitation	The students have to read distributed materials for a lecture	Tsujimura
10-11	12/15 12/22	Assessment of QOL	The students have to read distributed materials for a lecture	Tsujimura
12-13	1/12 1/19	Food texture and swallowing function	The students have to read distributed materials for a lecture	Tsujimura

14-15	1/26 2/2	Assessment of ingestive function	The students have to read distributed materials for a lecture	Tsujimura
16	2/9	Summary and examination (possible, on remote)	The students have to read distributed materials for a lecture	Tsujimura
<p><b>【Evaluation】</b> Oral test or written examination (50%) and report (50%).</p> <p><b>【Media】</b> Handout supplied by Div. Dysphagia Rehabilitation</p> <p><b>【Reference book】</b> Research papers will be provided if needed.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5341	1	Mon/5・IA	2	9114	Lecture・Seminar・Practice
230N5343		Mon/7・IIA			
230N5342	2	Mon/5・IB	2	9115	Lecture・Seminar・Practice
230N5344		Mon/7・IIB			
Course	Seminar on Evaluation of Feeding Function IA, IIA, IB, IIB				
Instructor	Lecturer Jin Magara (Dysphagia Rehabilitation Unit)				
Place	Laboratory of Div. Dysphagia Rehabilitation & Alliance laboratory E105				
IA・IIA					
<b>【Course outline】</b> The purpose of this seminar is to progress the fundamental knowledge about the ingestion using assessment of feeding function. The aim of this seminar is also to understand how to utilize videofluorography and videoendoscopy and analyze obtained images.					
<b>【Course aim】</b> This course provides students the technical knowledge and basic technique for assessment of feeding function and for clinical approaches to dysphagic patients.					
<b>【Attainment target】</b> Students will be able to understand the purpose of the evaluation for feeding function and to practice the basic procedure. Students will be able to evaluate the feeding function and explain how to analyze the images.					
<b>【Study method・attention】</b>					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10	Guidance	Check the key points of the handout		Jin Magara
2	4/17	Outline of Screening test	Check the key points of the handout		Jin Magara
3-4	4/24 5/1	Practice of Screening test	Check the key points of the handout regarding Screening test		Jin Magara
5-6	5/8 5/15	Practice of Videofluorography	Summarize the handout of Videofluorography		Jin Magara
7-8	5/22 5/29	Analysis of Videofluorography	Read and summarize the paper regarding Videofluorography		Jin Magara
9-10	6/5	Practice of Videoendoscopy	Summarize the handout		Jin Magara



	6/12		of Videoendoscopy	
11-12	6/19 6/26	Analysis of Videoendoscopy	Read and summarize the paper regarding Videoendoscopy	Jin Magara
13-14	7/3 7/10	Assessment of Oral function	Summarize the handout of Oral function	Jin Magara
15	7/24	Interpretation of assessment of Oral hypofunction	Read and summarize the paper regarding Oral hypofunction	Jin Magara
16	7/31	Examination (possible, on remote)	Check the key points of the handout	Jin Magara

#### 【Evaluation】

Oral test or written examination (50%) and report (50%).

#### 【Media】

Handout supplied by Div. Dysphagia Rehabilitation

#### 【Reference book】

Dysphagia: Clinical Management in Adults and Children, Michael E. Groher, Michael A. Crary

Endoscopic Evaluation and Treatment of Swallowing Disorders 2nd Edition, Susan Langmore

Oropharyngeal Dysphagia: Videoendoscopy-Guided Work-up and Management, Gauthier Desuter

#### IB・IIB

#### 【Course outline】

Lectures are aimed to understand rehabilitation technique based on the dysphagia assessment the through several dysphagia clinical cases.

#### 【Course aim】

This course provides students the technical knowledge and basic technique for assessment of feeding function and for clinical approaches to dysphagic patients.

#### 【Attainment target】

Students will be able to understand the purpose of the evaluation for feeding function and to practice the basic procedure.

Students will be able to understand and explain the purpose of dysphagia rehabilitation and acquire the basic procedure.

#### 【Study method・attention】

The students have to do a preparation for a lecture using textbooks, literature or any source materials needed.

Full contents the students have to prepare in each time will be supplied at the first time.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/16	Guidance	Check the key points of the handout	Jin Magara
2	10/23	Outline of therapy	Check the key points of	Jin Magara

			the handout	
3-4	10/30 11/6	Basic of Indirect therapy	Check the points of the Indirect therapy	Jin Magara
5-6	11/13 11/20	Practice of Indirect therapy	Read and summarize the paper regarding Indirect therapy	Jin Magara
7-8	11/27 12/4	Basic of Direct therapy	Check the key points of the handout	Jin Magara
9-10	12/11 12/18	Practice of Direct therapy	Read and summarize the paper regarding Direct therapy	Jin Magara
11	12/25	Compensation Method	Check the points of the Compensation Method	Jin Magara
12	1/9	Compensation Method	Read and summarize the paper regarding Compensation Method	Jin Magara
13	1/15	Prosthetic Treatment for Dysphagia patients	Check the key points of the handout	Jin Magara
14-15	1/22 1/29	Nutritional Assessment	Check the points of the Nutritional Assessment	Jin Magara
16	2/5	Examination (possible, on remote)	Check the key points of the handout	Jin Magara
<p><b>【Evaluation】</b>  Oral test or written examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout supplied by Div. Dysphagia Rehabilitation</p> <p><b>【Reference book】</b>  Dysphagia: Clinical Management in Adults and Children, Michael E. Groher, Michael A. Crary  Endoscopic Evaluation and Treatment of Swallowing Disorders 2nd Edition, Susan Langmore  Oropharyngeal Dysphagia: Videoendoscopy-Guided Work-up and Management, Gauthier Desuter</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5345	1	Mon/1・IA	2	9114	Lecture
230N5347		Fri/5・IIA			
230N5346	2	Mon/1・IB	2	9115	Lecture
230N5348		Fri/5・IIB			
Course	Periodontal Therapy: Basic Course IA, IIA, IB, IIB				
Instructor	Prof. Koichi Tabeta, Associate Prof. Naoki Takahashi				
Place	Laboratory (E411) at Division of Periodontology, E4 Refresh room (E417)				
IA・IIA					
<p>【Course outline】</p> <p>Periodontal diseases are multifactorial and inflammatory diseases. It is important to conduct the treatment based on a strategic treatment planning with deep knowledge of periodontology and periodontics from basic and clinical aspect. This course will provide knowledge required for a periodontist.</p> <p>【Course aim】</p> <p>Students will obtain current knowledge and concept for periodontics and periodontology.</p> <p>Students will obtain critical knowledge required for treating periodontal disease as a specialist.</p> <p>【Attainment target】</p> <p>Students will be able to</p> <p>1) explain etiology for periodontal diseases.</p> <p>2) explain treatments and evidences in periodontal therapy.</p> <p>3) explain statistics of data analyses.</p> <p>4) explain regenerative periodontal therapy.</p> <p>【Study method・attention】</p> <p>The lecture will be provided using slides and video. Students are required to read the textbook before attending the class.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10 4/7	Etiology and symptom	Textbook①pp96-107		Tabeta K
2	4/17 4/14	Basic periodontal examination, Diagnosis, Treatment planning	Textbook①pp108-115		Tabeta K
3	4/24 4/21	Plaque control	Textbook①pp138-148		Tabeta K
4	5/1 4/28	Scaling and root planing	Textbook①pp149-164		Tabeta K
5	5/8 5/12	Drug therapeutics	Textbook①pp318-327		Tabeta K

6	5/15 5/19	Periodontal surgery	Textbook①pp181-196	Tabeta K
7	5/22 5/26	Furcation treatment	Textbook①pp245-256	Tabeta K
8	5/29 6/2	Maintenance and supportive periodontal treatment	Textbook①pp309-318	Tabeta K
9	6/5 6/9	New periodontal examination for regenerative therapy	Textbook①pp116-123	Takahashi N
10	6/12 6/16	Biological evidence for bone grafting procedure with artificial graft materials	Textbook①pp234-239	Takahashi N
11	6/19 6/23	Biological evidence for GTR procedure with resorbable membrane	Textbook①pp214-219	Takahashi N
12	6/26 6/30	Concept and review for surgery with enamel matrix derivative protein	Textbook①pp220-225	Takahashi N
13	7/3 7/7	Concept and review for surgery with basic FGF growth factor	Textbook①pp226-233	Takahashi N
14	7/10 7/14	Concept and review for surgery with platelet-derived growth factor	Textbook①pp240-244	Takahashi N
15	7/24 7/21	Concept and review for surgery with autologous cultured periosteal sheet Examination	Textbook①pp207-213	Takahashi N

#### 【Evaluation】

Classroom attitude (10%), Reports imposed during the course (40%), Written examination at the end of the course (50%)

#### 【Media】

① Clinical Periodontology 3<sup>rd</sup> edition (ISBN978-4-263-45844-0, Ishiyaku Publishers, Inc., 11,000yen)

#### 【Reference book】

- Regeneration (ISBN978-4-87417-881-2, Quintessence Publishing, 14,300yen)
- Dental Regenerative Medicine (ISBN978-4-263-45838-9, Ishiyaku Publishers, Inc., 16,500yen)

#### IB・IIB

#### 【Course outline】

This course is designed to provide essential clinical knowledge for professional periodontal treatment with scientific viewpoints. The course will cover the latest findings on the etiology and pathogenesis of periodontal disease and the techniques used in periodontal surgery.

#### 【Course aim】

Students will obtain current knowledge and concept for periodontics and periodontology.  
Students will obtain critical knowledge required for treating periodontal disease as a specialist.

#### 【Attainment target】

Students will be able to

1) explain etiology for periodontal diseases. 2) explain regenerative periodontal therapy. <b>【Study method・attention】</b> The lecture will be provided using slides and video. Students are required to read the textbook before attending the class.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/16 10/6	Pathological change of periodontium	Textbook①pp2-14	Tabeta K
2	10/23 10/13	Classification	Textbook①pp15-22	Tabeta K
3	10/30 10/20	Epidemiology, prevention and statistics	Textbook①pp86-95	Tabeta K
4	11/6 10/27	Bacterial plaque	Textbook①pp32-41	Tabeta K
5	11/13 11/10	Inflammatory and immunological responses	Textbook①pp42-49	Tabeta K
6	11/20 11/17	Genetic factors	Textbook①pp63-68	Tabeta K
7	11/27 11/24	Risk factors	Textbook①pp23-31	Tabeta K
8	12/4 12/1	Procedure of regenerative surgery with autogenous and/or allo bone graft	Textbook②pp20-29	Takahashi N
9	12/11 12/8	Procedure of regenerative surgery with artificial bone graft materials	Textbook②pp20-29	Takahashi N
10	12/18 12/15	Procedure of regenerative surgery with resorbable GTR membrane	Textbook②pp30-41	Takahashi N
11	12/25 12/22	Procedure of regenerative surgery with enamel matrix derivative protein	Textbook②pp42-55	Takahashi N
12	1/9 1/12	Procedure of regenerative surgery with basic FGF growth factor	Textbook②pp68-77	Takahashi N
13	1/15 1/19	Procedure of regenerative surgery with platelet rich fibrin membrane	Textbook②pp56-66	Takahashi N
14	1/22 1/26	Procedure of regenerative surgery with autologous cultured periosteal sheet	Textbook②pp132-141	Takahashi N
15	1/29	Case presentation, Summary	Textbook①pp345-355	Takahashi N

	2/2	Examination		
<p><b>【Evaluation】</b>  Classroom attitude (10%), Reports imposed during the course (40%), Written examination at the end of the course (50%)</p> <p><b>【Media】</b>  ① Clinical Periodontology 3<sup>rd</sup> edition (ISBN978-4-263-45844-0, Ishiyaku Publishers, Inc., 11,000yen)  ② Regeneration (ISBN978-4-87417-881-2, Quintessence Publishing, 14,300yen)</p> <p><b>【Reference book】</b>  • Dental Regenerative Medicine (ISBN978-4-263-45838-9, Ishiyaku Publishers, Inc., 16,500yen)</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5349	1	Wed/5・IA	2	9114	Lecture・Seminar
230N5351		Mon/6・IIA			
230N5350	2	Wed/5・IB	2	9115	Lecture・Seminar
230N5352		Mon/6・IIB			
Course	Periodontal Regenerative Therapy IA, IIA, IB, IIB				
Instructor	Associate Prof. Naoki Takahashi, Lecturer. Yukari Nonaka				
Place	Laboratory (E411) at Division of Periodontology, E4 Refresh room (E417)				
IA・IIA					
<b>【Course outline】</b> The course will offer the basic knowledge, concept and guideline for periodontal regenerative therapy by lecture.					
<b>【Course aim】</b> The aims of this course are to understand each topics as followed, examination, diagnosis, guideline, basic flap surgery, bone graft procedure, GTR method, and advanced surgeries by enamel matrix derivative, platelet rich plasma, platelet rich fibrin, and autologous cultured periosteum.					
<b>【Attainment target】</b> The goals in this course are 1) to understand and learn basic knowledge and concept for periodontal regenerative therapy, 2) to master guideline for each regenerative periodontal surgeries, 3) to learn how to gather and organize clinical data.					
<b>【Study method・attention】</b> The lecture will be conducted with slides and video. Participants should be read the textbook designated and/or contents-relevant papers before attending. The concrete content of the preparations learning of each time will be indicated at the time of a first class.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/12 4/10	New periodontal examination for regenerative therapy	Textbook①pp96-107	Nonaka Y	
2	4/19 4/17	New technique of standardized examination of attachment level and bone level	Textbook①pp96-107	Nonaka Y	
3	4/26 4/24	Guideline of periodontal regenerative therapy for periodontitis patients	Textbook①pp96-107	Nonaka Y	
4	5/10 5/1	Biological evidence for bone grafting procedure with autogenous and/or allo graft	Textbook①pp234-239	Nonaka Y	
5	5/17 5/8	Biological evidence for bone grafting procedure with artificial graft materials	Textbook①pp234-239	Nonaka Y	

6	5/24 5/15	Biological evidence for GTR procedure with non-resorbable membrane	Textbook①pp214-219	Nonaka Y
7	5/31 5/22	Biological evidence for GTR procedure with resorbable membrane	Textbook①pp214-219	Nonaka Y
8	6/7 5/29	Concept and review for surgery with enamel matrix derivative protein	Textbook①pp220-225	Takahashi N
9	6/14 6/5	Concept and review for surgery with basic FGF growth factor	Textbook①pp226-233	Takahashi N
10	6/21 6/12	Concept and review for surgery with platelet-derived growth factor	Textbook①pp240-244	Takahashi N
11	6/28 6/19	Concept and review for surgery with tissue-engineering	Textbook①pp207-213	Takahashi N
12	7/5 6/26	Concept and review for surgery with platelet rich plasma	Textbook①pp240-244	Takahashi N
13	7/12 7/3	Concept and review for surgery with platelet rich fibrin membrane	Textbook①pp240-244	Takahashi N
14	7/19 7/10	Concept and review for surgery with autologous cultured periosteal sheet	Textbook①pp240-244	Takahashi N
15	7/26 7/24	How to gather and organize clinical data Examination	Textbook①pp345-355	Takahashi N Nonaka Y

#### 【Evaluation】

Classroom attitude (30%), Reports (40%), examination (30%)

#### 【Media】

① Clinical Periodontology 3<sup>rd</sup> edition (ISBN978-4-263-45844-0, Ishiyaku Publishers, Inc., 11,000yen)

#### 【Reference book】

- Regeneration (ISBN978-4-87417-881-2, Quintessence Publishing, 14,300yen)
- Dental Regenerative Medicine (ISBN978-4-263-45838-9, Ishiyaku Publishers, Inc., 16,500yen)

#### IB・IIB

#### 【Course outline】

The course will offer the advanced knowledge, concept and guideline for periodontal regenerative therapy by lecture.

#### 【Course aim】

The aims of this course are to understand more practical knowledge about follow topics, basic flap surgery, bone graft procedure, GTR method, and advanced surgeries by enamel matrix derivative, platelet rich plasma, platelet rich fibrin, and autologous cultured periosteum.

#### 【Attainment target】

The goals in this course are 1) to understand and learn advanced knowledge and concept for periodontal regenerative therapy, 2) to master procedures for each regenerative periodontal surgeries, 3) to learn how to gather and organize clinical data.



<b>【Study method・attention】</b> The lecture will be conducted with slides and video. Participants should be read the textbook designated and/or contents-relevant papers before attending. The concrete content of the preparations learning of each time will be indicated at the time of a first class.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4 10/16	New technique of standardized examination of attachment level and bone level	Textbook①pp96-107	Nonaka Y
2	10/11 10/23	New technique to sharpen periodontal curettes	Textbook①pp149-164	Nonaka Y
3	10/18 10/30	Procedures to make full-thickness flap and /or partial thickness flap	Textbook①pp187-189	Nonaka Y
4	10/25 11/6	Procedures to master some suture techniques	Textbook①pp185-186	Nonaka Y
5	11/1 11/13	Procedure of regenerative surgery with autogenous and/or allo bone graft	Textbook①pp234-239	Nonaka Y
6	11/8 11/20	Procedure of regenerative surgery with artificial bone graft materials	Textbook①pp234-239	Nonaka Y
7	11/15 11/27	Procedure of regenerative surgery with non-resorbable GTR membrane	Textbook①pp214-219	Nonaka Y
8	11/22 12/4	Procedure of regenerative surgery with resorbable GTR membrane	Textbook①pp214-219	Takahashi N
9	11/29 12/11	Procedure of regenerative surgery with enamel matrix derivative protein	Textbook①pp220-225	Takahashi N
10	12/6 12/18	Procedure of regenerative surgery with basic FGF growth factor	Textbook①pp226-233	Takahashi N
11	12/13 12/25	Procedure of regenerative surgery with platelet-derived growth factor	Textbook①pp240-244	Takahashi N
12	12/20 1/9	Procedure of regenerative surgery with platelet rich plasma	Textbook①pp240-244	Takahashi N
13	1/10 1/15	Procedure of regenerative surgery with platelet rich fibrin membrane	Textbook①pp240-244	Takahashi N
14	1/17 1/22	Procedure of regenerative surgery with autologous cultured periosteal sheet	Textbook①pp240-244	Takahashi N
15	1/24 1/29	Case presentation, Summary Examination	Textbook①pp345-355	Takahashi N Nonaka Y

**【Evaluation】**

Classroom attitude (30%), Reports (40%), examination (30%)

**【Media】**

① Clinical Periodontology 3<sup>rd</sup> edition (ISBN978-4-263-45844-0, Ishiyaku Publishers, Inc., 11,000yen)

**【Reference book】**

- Regeneration (ISBN978-4-87417-881-2, Quintessence Publishing, 14,300yen)
- Dental Regenerative Medicine (ISBN978-4-263-45838-9, Ishiyaku Publishers, Inc., 16,500yen)

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5353	1	Wed／1・I A	2	9114	Lecture・Seminar
230N5355		Wed／6・IIA			
230N5354	2	Wed／1・I B	2	9115	Lecture・Seminar
230N5356		Wed／6・IIB			
Course	Seminar for Periodontal therapy IA, IIA, IB, IIB				
Instructor	Prof. Koichi Tabeta, Lecturer. Yukari Nonaka				
Place	Laboratory (E411) at Division of Periodontology, E4 Refresh room (E417)				
IA・IIA					
【Course outline】 Seminar on Periodontal therapy is the lecture and seminar to obtain knowledge of basic structure of the periodontal tissues and classification of periodontal disease to learn the process of diagnosis. Additionally, presentation and discussion will be performed for understanding the relationship between periodontal diseases and systemic diseases.					
【Course aim】 The aim of this course is to: ・Understand the structure of periodontal tissues ・Understand the classification, symptoms and causes of periodontal disease ・Understand the process for diagnosis of periodontal disease ・Understand the relationship between periodontitis and systemic diseases					
【Attainment target】 Students should be able to: ・Explain the characterization of periodontal tissues ・List the types of periodontal disease and explain their symptoms and causes ・Explain the process to diagnose periodontal disease ・Describe the relationship between periodontitis and systemic diseases					
【Study method・attention】 This course consists of lectures and seminar. Participants will be required to obtain the fundamental knowledge through handouts and reference books prior to each class. The details will be announced at the guidance.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Guidance	The details will be given in class		Tabeta K
2	4/19	Structure of periodontal tissue	Summary of handouts		Tabeta K
3	4/26	Classification of periodontal diseases	Summary of handouts		Tabeta K
4	5/10	Symptoms of periodontal diseases	Summary of handouts		Tabeta K

5	5/17	Pathogenesis of periodontitis	Summary of handouts	Tabeta K
6	5/24	Microbiology of periodontal disease	Summary of handouts	Tabeta K
7	5/31	Susceptibility of periodontitis	Summary of handouts	Nonaka Y
8	6/7	Case presentation	Summary of handouts	Nonaka Y
9	6/14	Trauma and occlusion	Summary of handouts	Nonaka Y
10	6/21	Endodontics and periodontics	Summary of handouts	Nonaka Y
11	6/28	Cysts and tumors in periodontium	Summary of handouts	Nonaka Y
12	7/5	Systemic diseases and periodontal diseases 1 (Presentation)	Preparation for presentation	Tabeta • Nonaka
13	7/12	Systemic diseases and periodontal diseases 2 (Presentation)	Preparation for presentation	Tabeta • Nonaka
14	7/19	Systemic diseases and periodontal diseases 3 (Presentation)	Preparation for presentation	Tabeta • Nonaka
15	7/26	Summary and Examination	Review	Tabeta • Nonaka

#### 【Evaluation】

Classroom attitude (30%) Presentation (40%) Oral examination (30%)

#### 【Media】

Original handouts and related research papers

#### 【Reference book】

##### 1. Main reference books

- Clinical Periodontology 3<sup>rd</sup> edition (Ishiyaku Publishers, Inc., Murakami S et al, edited, 11,000 yen)

##### 2. Recommended books

- Glossary of periodontal terms 3<sup>rd</sup> edition 2019 (Ishiyaku Publishers, Inc., Japanese Society of Periodontology edited, 3,740 yen)
- Guideline of periodontal treatment 2022 (Ishiyaku Publishers, Inc., Japanese Society of Periodontology edited, 2,420 yen)

#### IB • IIB

#### 【Course outline】

This course is the lecture and seminar to acquire the skills of clinical examinations and treatment planning.

#### 【Course aim】

The aim of this course is to:

- Acquire the procedures of clinical periodontal examination to make a treatment plan
- Understand the content of a series of periodontal treatments
- Understand the content of comprehensive approach for periodontal treatment

#### 【Attainment target】

Students should be able to:

- Explain the procedures of the examination to diagnose periodontal disease

<ul style="list-style-type: none"> <li>• Explain the content of a series of periodontal treatments</li> <li>• Explain the overview of comprehensive periodontal treatment</li> </ul> <p><b>【Study method・attention】</b></p> <p>This course consists of lectures and seminar. Participants will be required to obtain the fundamental knowledge through handouts and reference books prior to each class. The details will be announced at the guidance.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	The details will be given in class	Tabeta K
2	10/11	Periodontal Examination	Summary of handouts	Tabeta K
3	10/18	Diagnosis of periodontal disease	Summary of handouts	Tabeta K
4	10/25	Treatment Planning	Summary of handouts	Tabeta K
5	11/1	Basic Periodontal Therapy	Summary of handouts	Tabeta K
6	11/8	Periodontal surgery 1 -Flap operation	Summary of handouts	Tabeta K
7	11/15	Periodontal surgery 2 -Periodontal plastic surgery	Summary of handouts	Nonaka Y
8	11/22	Periodontal surgery 3 -Regenerative periodontal therapy	Summary of handouts	Nonaka Y
9	11/29	Furcation treatment	Summary of handouts	Nonaka Y
10	12/6	Occlusal therapy	Summary of handouts	Nonaka Y
11	12/13	Prosthodontics, Orthodontics, Implants and periodontics	Summary of handouts	Nonaka Y
12	12/20	Maintenance and supportive periodontal treatment	Summary of handouts	Nonaka Y
13	1/10	Treatment Planning 1 (Presentation)	Preparation for presentation	Tabeta ・ Nonaka
14	1/17	Treatment Planning 2 (Presentation)	Preparation for presentation	Tabeta ・ Nonaka
15	1/24	Summary and Examination	Review	Tabeta ・ Nonaka
<p><b>【Evaluation】</b></p> <p>Classroom attitude (30%) Presentation (40%) Oral examination (30%)</p> <p><b>【Media】</b></p> <p>Original handouts and related research papers</p>				

**【Reference book】**

1. Main reference books

- Clinical Periodontology 3<sup>rd</sup> edition (Ishiyaku Publishers, Inc., Murakami S et al, edited, 11,000 yen)

2. Recommended books

- Glossary of periodontal terms 3<sup>rd</sup> edition 2019 (Ishiyaku Publishers, Inc., Japanese Society of Periodontology edited, 3,740 yen)
- Guideline of periodontal treatment 2022 (Ishiyaku Publishers, Inc., Japanese Society of Periodontology edited, 2,420 yen)

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5357	1	Mon／2・I A	2	9114	Lecture
230N5359		Fri／6・IIA			
230N5358	2	Mon／2・I B	2	9115	Lecture
230N5360		Fri／6・IIB			
Course	Infection control and restoration of tissue integrity IA, IIA, IB, IIB				
Instructor	Prof. Koichi Tabeta, Associate Prof. Naoki Takahashi				
Place	Laboratory (E411) at Division of Periodontology, E4 Refresh room (E417)				
IA・IIA					
【Course outline】 This course demonstrates the characteristics of periodontal tissues and the immunopathogenesis of periodontal diseases.					
【Course aim】 The aim of this course is to understand and acquire the basic knowledge about the characteristics of periodontal tissue and the pathogenesis of periodontal disease for conducting periodontal research.					
【Attainment target】 Explain the characteristics of periodontal tissue. Explain the pathogenesis of periodontal disease.					
【Study method・attention】 This course consists of lectures. Participants will be required to obtain the fundamental knowledge through handouts and reference books prior to each class. The details will be announced at the first class.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10 4/7	Characteristic feature of periodontal tissue 1	Summary of handouts		Tabeta K
2	4/17 4/14	Characteristic feature of periodontal tissue 2	Summary of handouts		Tabeta K
3	4/24 4/21	Characteristic feature of periodontal tissue 3	Summary of handouts		Tabeta K
4	5/1 4/28	Periodontopathic bacteria 1	Summary of handouts		Tabeta K
5	5/8 5/12	Periodontopathic bacteria 2	Summary of handouts		Tabeta K
6	5/15 5/19	Periodontopathic bacteria 3	Summary of handouts		Tabeta K

7	5/22 5/26	Innate immune system 1	Summary of handouts	Tabeta K
8	5/29 6/2	Innate immune system 2	Summary of handouts	Tabeta K
9	6/5 6/9	Innate immune system 3	Summary of handouts	Takahashi N
10	6/12 6/16	Acquired immune system 1	Summary of handouts	Takahashi N
11	6/19 6/23	Acquired immune system 2	Summary of handouts	Takahashi N
12	6/26 6/30	Acquired immune system 3	Summary of handouts	Takahashi N
13	7/3 7/7	Immunopathogenesis of periodontal disease 1	Summary of handouts	Takahashi N
14	7/10 7/14	Immunopathogenesis of periodontal disease 2	Summary of handouts	Takahashi N
15	7/24 7/21	Immunopathogenesis of periodontal disease 3 Examination	Summary of handouts	Takahashi N

#### 【Evaluation】

Classroom attitude (10%) report (40%) Oral examination (50%)

#### 【Media】

Original handouts and related research papers

#### 【Reference book】

Clinical Periodontology 3<sup>rd</sup> edition (Ishiyaku Publishers, Inc., Murakami S et al, edited, 11,000 yen)

#### IB・IIB

#### 【Course outline】

This course demonstrates principal of periodontal tissue regeneration based on the immune pathology. In addition, we discuss the relationship between periodontal diseases and systemic diseases to understand contribution of oral health for maintaining systemic health.

#### 【Course aim】

The aim of this course is to understand and acquire the basic knowledge about the periodontal tissue regeneration and periodontal medicine for conducting periodontal research.

#### 【Attainment target】

Explain the immunological mechanisms of periodontal tissue regeneration.

Explain the relationship between periodontal diseases and systemic disease.

#### 【Study method・attention】

This course consists of lectures. Participants will be required to obtain the fundamental knowledge through handouts and reference books prior to each class. The details will be announced at the first class.



【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/16 10/6	Immunological basis of periodontal tissue regeneration 1	Summary of handouts	Tabeta K
2	10/23 10/13	Immunological basis of periodontal tissue regeneration 2	Summary of handouts	Tabeta K
3	10/30 10/20	Immunological basis of periodontal tissue regeneration 3	Summary of handouts	Tabeta K
4	11/6 10/27	Immunological basis of periodontal tissue regeneration, Discussion	Summary of handouts	Tabeta K
5	11/13 11/10	Periodontal disease and systemic diseases, Introduction	Summary of handouts	Tabeta K
6	11/20 11/17	Role of commensal bacteria	Summary of handouts	Tabeta K
7	11/27 11/24	Periodontal disease and systemic diseases 1	Summary of handouts	Tabeta K
8	12/4 12/1	Periodontal disease and systemic diseases 2	Summary of handouts	Takahashi N
9	12/11 12/8	Periodontal disease and systemic diseases 3	Summary of handouts	Takahashi N
10	12/18 12/15	Periodontal disease and systemic diseases 4	Summary of handouts	Takahashi N
11	12/25 12/22	Periodontal disease and systemic diseases 5	Summary of handouts	Takahashi N
12	1/9 1/12	Periodontal disease and systemic diseases 6	Summary of handouts	Takahashi N
13	1/15 1/19	Recent research topics 1	Summary of handouts	Takahashi N
14	1/22 1/26	Recent research topics 2	Summary of handouts	Takahashi N
15	1/29 2/2	Recent research topics 3 Examination	Summary of handouts	Takahashi N
<b>【Evaluation】</b> Classroom attitude (10%) report (40%) Oral examination (50%) <b>【Media】</b> Original handouts and related research papers <b>【Reference book】</b> Clinical Periodontology 3 <sup>rd</sup> edition (Ishiyaku Publishers, Inc., Murakami S et al, edited, 11,000 yen)				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5361	1	Tue/5・IB	2	9115	Lecture・Seminar
230N5363		Tue/6・IIB			
230N5362	2	Tue/5・IA	2	9114	Lecture・Seminar
230N5364		Tue/6・IIA			
Course	Seminar on Diagnosis of Periodontitis IA, IIA, IB, IIB				
Instructor	Associate Prof. Tetsuo Kobayashi				
Place	Laboratory Room at Division of Periodontology				
IA・IIA					
【Course outline】 The seminar on diagnosis of periodontitis IA・IIA aims to obtain knowledge and skills for the clinical examinations as well as for the genetic and immunological analyses of clinical materials that are essential for diagnosis the activity and susceptibility of periodontitis.					
【Course aim】 Students will be required to obtain knowledge on the activity and susceptibility of periodontitis and also to acquire skills for isolation of sera and genomic DNA and for ELISA and genotyping in this course.					
【Attainment target】 Students will be able to explain the following points: the activity and susceptibility of periodontitis, isolation of sera and genomic DNA, ELISA, and genotyping.					
【Study method・attention】 This course consists of lecture and seminar. Students will be required to obtain the fundamental knowledge through the lecture with slide and handout, and also to acquire the skills by the seminar. Students will receive the handout and be informed of the preparation for lessons at the guidance of this course. Students will be required to read the textbook 1, Clinical Periodontology, and the handout prior to the lesson.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	10/3	Guidance	Textbook 1 pp15-22		Kobayashi T
2, 3	10/10 10/17	Basic Diagnosis of Periodontitis Activity 1,2	Textbook 1 pp23-31		Kobayashi T
4, 5	10/24 10/31	Evaluation of Periodontitis Activity 1,2	Textbook 1 pp116-123		Kobayashi T
6, 7	11/7 11/14	Advanced Diagnosis of Periodontitis Activity 1,2	The handout 1		Kobayashi T
8-10	11/21 11/28 12/5	Basic Diagnosis of Periodontitis Susceptibility 1-3	Textbook 1 pp63-68		Kobayashi T
11, 12	12/12	Evaluation of Periodontitis Susceptibility 1,2	Textbook 1 pp119-123		Kobayashi T

	12/19			
13-15	12/26 1/16 1/23	Advanced Diagnosis of Periodontitis Susceptibility 1-3	The handout 2	Kobayashi T
16	1/30	Examination	Review of lesson No. 1-15	Kobayashi T
<p><b>【Evaluation】</b></p> <p>The written examination at the end of the course 70%, the report imposed during the course 15%, and the attitude in the class 15%.</p> <p><b>【Media】</b></p> <p>Textbook 1 : Murakami S, et al (ed.) Clinical Periodontology 3<sup>rd</sup>. edition (Ishiyaku Publishers), 10,000 yen</p> <p><b>【Reference book】</b></p> <p>Strachan T, et al (ed.) Human Molecular Genetics, 4<sup>th</sup> edition (Medical Science International), 12,000 yen</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b></p> <p>The seminar on diagnosis of periodontitis IB・IIB aims to obtain knowledge and skills for the immunological analyses for the relationship between periodontitis and systematic diseases such as rheumatic disease.</p> <p><b>【Course aim】</b></p> <p>Students will be required to obtain knowledge on the relationship between periodontitis and systematic diseases such as rheumatic disease, and also to acquire skills for the specific ELISA in this course.</p> <p><b>【Attainment target】</b></p> <p>Students will be able to explain the following points: the relationship between periodontitis and systematic diseases such as rheumatic diseases, and the specific ELISA.</p> <p><b>【Study method・attention】</b></p> <p>This course consists of lecture and seminar. Students will be required to obtain the fundamental knowledge through the lecture with slide and handout, and also to acquire the skills by the seminar. Students will receive the handout and be informed of the preparation for lessons at the guidance of this course. Students will be required to read the textbook 2, the Periodontology, and the handout prior to the lesson.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	4/11	Guidance	Textbook 2 pp60-61	Kobayashi T
2-4	4/18 4/25 5/2	Periodontitis and Systemic Diseases 1-3	Textbook 2 pp62-76, pp79-82	Kobayashi T
5, 6	5/9 5/16	Periodontitis and Rheumatic Diseases 1, 2	Textbook 2 pp77-78	Kobayashi T
7, 8	5/23 5/30	Examination of Rheumatic Diseases 1, 2	The handout 1	Kobayashi T
9, 10	6/6	Effect of Periodontal Therapy on Rheumatic	Textbook 2 pp77-78,	Kobayashi T

	6/13	Diseases 1, 2	the handout 2	
11, 12	6/20 6/27	Cytokine Targeted Therapy for Rheumatic Diseases 1, 2	The handout 3	Kobayashi T
13-15	7/4 7/11 7/18	Effect of Rheumatic Disease Therapy on Periodontitis 1-3	The handout 4	Kobayashi T
16	7/25	Examination	Review of lesson No. 1-15	Kobayashi T

**【Evaluation】**

The written examination at the end of the course 70%, the report imposed during the course 15%, and the attitude in the class 15%.

**【Media】**

Textbook 2 : Numabe Y, et al (ed.) The Periodontology 3<sup>rd</sup>. edition (Nagasueshoten), 9,000 yen

**【Reference book】**

Japanese Society of Periodontology (ed.) Periodontal Disease and Systemic Health (Ishiyaku Publishers), 2,000 yen

Department of Tissue Regeneration and  
Reconstruction

## Department of Tissue Regeneration and Reconstruction

Course	Page
Anatomy and Cell Biology of the Hard Tissue IA, IIA, IB, IIB	253
Seminar on morphology of hard tissues IA, IIA, IB, IIB	258
Oral pathology diagnostics IA, IIA, IB, IIB	261
The molecular biological experimental methods for oral pathological research IA, IIA, IB, IIB	265
Clinical oral pathology diagnostics seminars IA, IIA, IB, IIB	268
Seminar on oral clinical cytology IA, IIA, IB, IIB	271
Practice for skeletal regeneration IA, IIA, IB, IIB	274
Seminar on the Reconstruction of Occlusal Functioning IA, IIA, IB, IIB	279
Evaluation of Stomatognathic Function by Digital Devices IA, IIA, IB, IIB	283
Advanced Dental Implant Therapy IA, IIA, IB, IIB	286
Seminar on Oral and Maxillofacial Tissue Reconstructive Surgery IA, IIA, IB, IIB	289
Seminar on Oral Oncology IA, IIA, IB, IIB	293
Diagnosis and Treatment of Developmental Maxillofacial Anomalies IA, IIA, IB, IIB	297
Oral and Maxillofacial Radiology IA, IIA, IB, IIB	301
Seminar on Diagnostic Imaging Practice in the Oral and Maxillofacial Region IA, IIA, IB, IIB	306
Head and neck radiation oncology IA, IIA, IB, IIB	314
Pain Management IA, IIA, IB, IIB	317
Seminar on Peripheral nerve regeneration IA, IIA, IB, IIB	320
Dental psychosomatic medicine IA, IIA, IB, IIB	324

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5401	1	Mon/ 5 ・ IA	2	9014	Lecture and Practice
230N5403		Tue/ 6 ・ IIA			
230N5402	2	Thu/ 5 ・ IB	2	9015	Lecture and Practice
230N5404		Wed/ 6 ・ IIB			
Course	Anatomy and Cell Biology of the Hard Tissue IA, IIA, IB, IIB				
Instructor	Prof. Hayato Ohshima (Div. Anatomy and Cell Biology of the Hard Tissue), ext. 2812, e-mail: histoman@dent.niigata-u.ac.jp				
Place	Seminar Room in Div. Anatomy and Cell Biology of the Hard Tissue				
IA ・ IIA					
【Course outline】 This course deals with tooth developmental biology based on the morphological research of hard tissue. 【Course aim】 The students shall understand tooth developmental biology based on the morphological research of hard tissue. 【Attainment target】 ・ The students can explain craniofacial development. ・ The students can explain tooth development. ・ The students can explain amelogenesis. ・ The students can explain enamel. ・ The students can explain dentinogenesis. ・ The students can explain dentin-pulp complex. ・ The students can explain development of the periodontium. ・ The students can explain periodontium. ・ The students can explain tooth eruption, shedding, and replacement. ・ The students can explain dentogingival junction. ・ The students can explain temporomandibular joint. ・ The students can explain bone biology. 【Study method・attention】 The students have to study the printed synopses beforehand and to study continuously during this course.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12 class 5 or 4/11 class 6	Guidance			Hayato Ohshima
2	4/19 class 5 or 4/18 class 6	Craniofacial development	Text p.23-		Hayato Ohshima
3	4/26 class	Tooth development	Text p.68-		Hayato

	5 or 4/25 class 6			Ohshima
4	5/10 class 5 or 5/2 class 6	Amelogenesis	Text p. 118-	Hayato Ohshima
5	5/17 class 5 or 5/9 class 6	Enamel	Text p. 118-	Hayato Ohshima
6	5/24 class 5 or 5/16 class 6	Dentinogenesis	Text p. 68-	Hayato Ohshima
7	5/31 class 5 or 5/23 class 6	Dentin-pulp complex (1)	Text p. 157-	Hayato Ohshima
8	6/7 class 5 or 5/30 class 6	Dentin-pulp complex (2)	Text p. 157-	Hayato Ohshima
9	6/14 class 5 or 6/6 class 6	Development of the periodontium	Text p. 68-	Hayato Ohshima
10	6/21 class 5 or 6/13 class 6	Periodontium	Text p. 193-	Hayato Ohshima
11	6/28 class 5 or 6/20 class 6	Tooth eruption, shedding, and replacement	Text p. 218-	Hayato Ohshima
12	7/5 class 5 or 6/27 class 6	Dentogingival junction	Text p. 193-	Hayato Ohshima
13	7/12 class 5 or 7/4 class 6	Temporomandibular joint	Text p. 289-	Hayato Ohshima
14	7/19 class 5 or 7/11 class 6	Bone Biology	Text p. 91-	Hayato Ohshima
15	7/26 class 5 or 7/18 class 6	Summary and Examination		Hayato Ohshima



**【Evaluation】**

Comprehensive evaluation to assess whether the students achieve attainment targets or not is performed by oral tests (20%) and evaluation of submitted reports (80%).

**【Media】**

- Ten Cate's Oral Histology. Development, structure, and formation, 9th Ed. (A. Nanci, ed., Mosby Co.)

**【Reference book】**

- Textbook and Color Atlas of Traumatic Injuries to the Teeth, 5th Ed. (J.O. Andreasen, F.M. Andreasen and L. Andersson ed., Blackwell)

**IB • IIB****【Course outline】**

This course deals with a series of processes on the morphological research of hard tissue from experimental design to presentation. The students shall learn how to determine the subject, make an experiment, understand the findings, write an article, and so on.

**【Course aim】**

The students shall understand a series of processes on the morphological research of hard tissue.

**【Attainment target】**

- The students can explain the composition of a research paper and how to write the manuscript.
- The students can perform the effective PubMed search.
- The students can make an experimental design.
- The students can perform the perfusion fixation
- The students can prepare paraffin sections.
- The students can take photographs using a microscope.
- The students can perform the immunohistochemistry.
- The students can use the confocal laser microscope.
- The students can process the images using Photo shop.
- The students can give a presentation on the research objective and strategy.

**【Study method・attention】**

The students have to study the printed synopses beforehand and to study continuously during this course.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4 class 6 or 10/5 class 5	Guidance		Hayato Ohshima
2	10/11 class 6 or 10/12 class 5	Reading of research paper	Printed synopses	Hayato Ohshima
3	10/18 class 6 or 10/19	Research objective and strategy	Printed synopses	Hayato Ohshima

	class 5			
4	10/25 class 6 or 10/26 class 5	PubMed search	Printed synopses	Hayato Ohshima
5	11/1 class 6 or 11/2 class 5	Experimental design	Printed synopses	Hayato Ohshima
6	11/8 class 6 or 11/9 class 5	Theory and practice of the perfusion fixation	Printed synopses	Hayato Ohshima
7	11/15 class 6 or 11/16 class 5	Theory and practice of the sample preparation (1)	Printed synopses	Hayato Ohshima
8	11/22 class 6 or 11/30 class 5	Theory and practice of the sample preparation (2)	Printed synopses	Hayato Ohshima
9	11/29 class 6 or 12/7 class 5	Theory and practice of the microscopic photography	Printed synopses	Hayato Ohshima
10	12/6 class 6 or 12/14 class 5	Theory and practice of the immunohistochemistry (1)	Printed synopses	Hayato Ohshima
11	12/13 class 6 or 12/21 class 5	Theory and practice of the immunohistochemistry (2)	Printed synopses	Hayato Ohshima
12	12/20 class 6 or 1/11 class 5	Theory and practice of the confocal laser microscopy	Printed synopses	Hayato Ohshima
13	1/10 class 6 or 1/18 class 5	Image process	Printed synopses	Hayato Ohshima
14	1/17 class 6 or 1/25 class 5	Presentation	Printed synopses	Hayato Ohshima

15	1/24 class 6 or 2/1 class 5	Summary and Examination		Hayato Ohshima
<p><b>【Evaluation】</b> Comprehensive evaluation to assess whether the students achieve attainment targets or not is performed by oral test (20%) and evaluation of presentation (80%).</p> <p><b>【Media】</b> Printed synopses will be distributed beforehand.</p> <p><b>【Reference book】</b></p> <ul style="list-style-type: none"> <li>• Ten Cate's Oral Histology. Development, structure, and formation, 9th Ed. (A. Nanci, ed., Mosby Co.)</li> <li>• Textbook and Color Atlas of Traumatic Injuries to the Teeth, 5th Ed. (J.O. Andreasen, F.M. Andreasen and L. Andersson ed., Blackwell)</li> </ul>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5405	1	Fri／5・IA	2	9014	Lecture・Practice
230N5407		Fri／6・IIA			
230N5406	2	Fri／5・IB	2	9015	Lecture・Practice
230N5408		Fri／6・IIB			
Course	Seminar on morphology of hard tissues IA, IIA, IB, IIB				
Instructor	Associate Prof. Hiroko Ida				
Place	Laboratory in Div. Anatomy and Cell Biology of the Hard Tissue				
IA・IIA					
<p>【Course outline】</p> <p>This course will offer a practical training to observe hard tissues morphologically.</p> <p>【Course aim】</p> <p>The students shall learn a series of experimental techniques of hard tissue research from preparation of the samples to <math>\mu</math>CT and microscopic analysis.</p> <p>【Attainment target】</p> <p>The students can</p> <ul style="list-style-type: none"><li>perform different types of analysis to observe hard tissues depending on the purpose.</li><li>perform some histological and immunohistochemical stainings and understand the findings.</li></ul> <p>【Study method・attention】</p> <p>Lecture and practice. The students have to study the printed synopses beforehand.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/7	Guidance	Read the handout		Hiroko Ida
2	4/14	Methods for analysis of hard tissue	Read the handout		Hiroko Ida
3	4/21	Methods for sample preparation (Fixation)	Read the handout		Hiroko Ida
4	4/28	Micro CT analysis	Read the handout		Hiroko Ida
5	5/12	Methods for sample preparation (Decalcification)	Read the handout		Hiroko Ida
6	5/19	Methods for sample preparation (dehydration, Embedding)	Read the handout		Hiroko Ida
7, 8	5/26 6/2	Methods for sample preparation (paraffin section) 1, 2	Read the handout		Hiroko Ida
9	6/9	Methods for sample preparation (frozen section)	Read the handout		Hiroko Ida
10, 11	6/16 6/23	Methods for histological stainings 1, 2	Read the handout		Hiroko Ida

12-14	6/30 7/7 7/14	Methods for immunohistochemical stainings 1-3	Read the handout	Hiroko Ida
15	7/21	Summary of hard tissue research	Read the handout	Hiroko Ida
16	8/4	Examination	Review the course	Hiroko Ida
<p><b>【Evaluation】</b> Oral examination (50%), Reports (50%)</p> <p><b>【Media】</b> Printed synopses will be distributed beforehand.</p> <p><b>【Reference book】</b> Research papers will be provided if needed.</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> The students shall practice a series of experimental techniques of tooth germ research from histological analysis and organ culture to gene analysis.</p> <p><b>【Course aim】</b> The students are required to understand the histological features of tooth germs, and shall learn <i>in vivo</i> and <i>in vitro</i> experimental techniques to analyze murine tooth germs.</p> <p><b>【Attainment target】</b> The students can</p> <ul style="list-style-type: none"> <li>• explain the development and histology of tooth germs.</li> <li>• prepare paraffin sections to observe tooth germs.</li> <li>• perform the organ culture of tooth germs.</li> </ul> <p><b>【Study method・attention】</b> Lecture and practice. The students have to study the printed synopses beforehand.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/6	Guidance, summary of tooth germ research	Read the handout	Hiroko Ida
2	10/13	Histological features of the tooth germ	Read the handout	Hiroko Ida
3	10/20	The molecular mechanisms during tooth morphogenesis	Read the handout	Hiroko Ida
4	10/27	Preparation of paraffin sections for tooth germ research	Read the handout	Hiroko Ida
5	11/10	Staining of paraffin sections for tooth germ research (embryonic tooth germ)	Read the handout	Hiroko Ida
6	11/17	Staining of paraffin sections for tooth germ research (postnatal tooth germ)	Read the handout	Hiroko Ida

7	11/24	Staining of paraffin sections for tooth germ research	Read the handout	Hiroko Ida
8	12/1	Organ culture of the tooth germ (Lecture)	Read the handout	Hiroko Ida
9, 10	12/8 12/15	Organ culture of the tooth germ (Practice) 1, 2	Read the handout	Hiroko Ida
11, 12	12/22 1/12	Gene analysis of the tooth germ (RT-PCR) 1, 2	Read the handout	Hiroko Ida
13	1/19	Gene analysis of the tooth germ (methods of regulating gene expression)	Read the handout	Hiroko Ida
14	1/26	The topics of tooth regeneration research	Read the handout	Hiroko Ida
15	2/2	Summary of tooth germ research	Read the handout	Hiroko Ida
16	2/16	Examination	Review the course	Hiroko Ida
<p><b>【Evaluation】</b>  Oral examination (50%), Reports (50%),</p> <p><b>【Media】</b>  Printed synopses will be distributed beforehand.</p> <p><b>【Reference book】</b>  Research papers will be provided if needed.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5409	1	Wednesday/ 5 ・ IA	2	9014	Lecture ・ Seminar ・ Practice (face-to-face class)
230N5411		Wednesday/ 5 ・ IIA			
230N5410	2	Wednesday/ 5 ・ IB	2	9015	Lecture ・ Seminar ・ Practice (face-to-face class)
230N5412		Wednesday/ 5 ・ IIB			
Course	Oral pathology diagnostics IA, IIA, IB, IIB				
Instructor	Prof. Jun-ichi Tanuma (Division of Oral Pathology)				
Place	Laboratory room of Division of Oral Pathology				
IA ・ IIA					
<b>【Course outline】</b> Seminar on oral pathology diagnostics is that it deals with the pathological concept of oral and salivary gland tumors from their pathogenesis based on the modern pathological methodology to their diagnostic issues based on the correlation between pathological and clinical findings.					
<b>【Course aim】</b> Students will understand the pathogenesis of oral and salivary gland tumors from their causative factors, molecular mechanism, clinical processes, to prognoses. Clinic-pathological aspects of their diagnostic criteria will be emphasized towards the end of their prevention and treatments.					
<b>【Attainment target】</b> Student will understand this course as follows; ・ Distinguishing clinicopathological features between benign and malignant oral and salivary gland tumors. ・ Understanding possible pathogenetic processes of oral and salivary gland tumors. ・ Understanding clinical and pathological diagnostic issues on oral and salivary gland tumors. ・ Understanding possible prevention strategies against oral and salivary gland tumors. ・ Understanding possible prevention strategies against oral cytology.					
<b>【Study method・attention】</b> Lecture, seminar and practice. To prepare for the class, students need to read textbooks and papers.					
<b>【Plan】</b>					
No.	Date	Contents		Out-of-Class Study	Instructor
1	04/12	Guidance		The details will be given in class	Jun-ichi Tanuma
2	04/19	Varieties of oral potentially malignant disorders		Textbook 1 pp239-256	Jun-ichi Tanuma
3	04/26	Clinical features of oral potentially malignant disorders (OPMDs)		Textbook 1 pp239-256	Jun-ichi Tanuma
4	05/10	Histopathological features of OPMDs		Textbook 1 pp239-256	Jun-ichi Tanuma

5	05/17	Corresponds to the clinical diagnosis of pathology of OPMDs	Textbook 1 pp239-256	Jun-ichi Tanuma
6	05/24	Varieties of oral cancer	Textbook 1 pp239-256	Jun-ichi Tanuma
7	05/31	Clinical features of oral cancer	Textbook 1 pp239-256	Jun-ichi Tanuma
8	06/07	Histopathological features of oral cancer	Textbook 1 pp239-256	Jun-ichi Tanuma
9	06/14	Corresponds to the clinical diagnosis of pathology of oral cancer	Textbook 1 pp239-256	Jun-ichi Tanuma
10	06/21	Screening and prevention of oral cancer	Textbook 1 pp239-256	Jun-ichi Tanuma
11	06/28	Varieties of salivary gland tumors	Textbook 1 pp257-270	Jun-ichi Tanuma
12	07/05	Clinical features of salivary gland tumors	Textbook 1 pp257-270	Jun-ichi Tanuma
13	07/12	Histopathological features of salivary gland tumors	Textbook 1 pp271-282	Jun-ichi Tanuma
14	07/19	Corresponds to the clinical diagnosis of pathology of salivary gland tumors	Textbook 1 pp271-282	Jun-ichi Tanuma
15	07/26	Screening of oral cytology	Textbook 2 pp1-120	Jun-ichi Tanuma
16	08/02	Examination	The details will be given in class	Jun-ichi Tanuma

#### 【Evaluation】

Examination (30%), Handing in papers (30%) and oral examinations (40%)

#### 【Media】

Textbook 1: New Oral Pathology (3rd ed.) (Ishiyaku Pub., Inc.) 11,000 yen

Textbook 2: Oral Cytology (1nd ed.) (Ishiyaku Pub., Inc.) 6,600 yen

#### 【Reference book】

Easy-to-understanding Pathology (7nd ed.) (Nankodo Co., Ltd.) 2,970 yen

#### IB・IIB

#### 【Course outline】

Seminar on oral pathology diagnostics is that it deals with the pathological concept of odontogenic and bone-related tumors from their pathogenesis based on the pathological methodology to their diagnostic issues based on the correlation between pathological and clinical findings.

#### 【Course aim】

Students will understand the pathogenesis of odontogenic and bone-related tumors from their causative



<p>factors, molecular mechanism, clinical processes, to prognoses. Clinic-pathological aspects of their diagnostic criteria will be emphasized towards the end of their prevention and treatments.</p> <p><b>【Attainment target】</b></p> <p>Student will understand this course as follows;</p> <ul style="list-style-type: none"> <li>• Distinguishing clinicopathological features between benign and malignant odontogenic and bone-related tumors.</li> <li>• Understanding possible pathogenetic processes of odontogenic and bone-related tumors.</li> <li>• Understanding clinical and pathological diagnostic issues on odontogenic and bone-related tumors.</li> <li>• Understanding possible prevention strategies against odontogenic and bone-related tumors.</li> </ul> <p><b>【Study method・attention】</b></p> <p>Lecture, seminar and practice. To prepare for the class, students need to read textbooks and papers.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/04	Varieties of odontogenic tumors	The details will be given in class	Jun-ichi Tanuma
2	10/11	Clinical features of odontogenic tumors	Textbook 1 pp196-211	Jun-ichi Tanuma
3	10/18	Histopathological features of odontogenic tumors	Textbook 1 pp196-211	Jun-ichi Tanuma
4	10/25	Corresponds to clinical diagnosis of pathology of odontogenic tumors	Textbook 1 pp196-211	Jun-ichi Tanuma
5	11/01	Screening and prevention of odontogenic tumors	Textbook 1 pp196-211	Jun-ichi Tanuma
6	11/08	Varieties of jaw and temporomandibular joint tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
7	11/15	Clinical features of jaw tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
8	11/22	Histopathological features of jaw tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
9	11/29	Corresponds to clinical diagnosis of pathology of jaw tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
10	12/06	Screening and prevention of jaw tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
11	12/13	Varieties of soft tissue tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
12	12/20	Clinical features of soft tissue tumors	Textbook 1 pp212-238	Jun-ichi Tanuma

13	01/10	Histopathological features of soft tissue tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
14	01/17	Corresponds to clinical diagnosis of pathology of soft tissue tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
15	01/24	Screening and prevention of soft tissue tumors	Textbook 1 pp212-238	Jun-ichi Tanuma
16	01/31	Examination	The details will be given in class	Jun-ichi Tanuma

**【Evaluation】**

Examination (30%), Handing in papers (30%) and oral examinations (40%)

**【Media】**

Textbook 1: New Oral Pathology (3rd ed.) (Ishiyaku Pub., Inc.) 11,000 yen

**【Reference book】**

Easy-to-understanding Pathology (7nd ed.) (Nankodo Co., Ltd.) 2,970 yen

**【Reference website】**

Div. of Oral Pathology HP: <http://www5.dent.niigata-u.ac.jp/~opatho/>

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5413	1	Friday/6・IA	2	9014	Lecture・Seminar・Practice (face-to-face class)
230N5415		Friday/6・IIA			
230N5414	2	Friday/6・IB	2	9015	Lecture・Seminar・Practice (face-to-face class)
230N5416		Friday/6・IIB			
Course	The molecular biological experimental methods for oral pathological research IA, IIA, IB, IIB				
Instructor	Prof. Jun-ichi Tanuma, Assistant Prof. Tatsuya Abé				
Place	Laboratory room of Division of Oral Pathology				
IA・IIA					
<p>【Course outline】</p> <p>Seminar on the molecular biological experimental methods for oral pathological research course is that it deals with the essential knowledge and research technique on molecular pathology for elucidating the mechanism of the pathogenesis, progresses and outcomes of various diseases in oral and maxillofacial region by lectures and practices.</p> <p>【Course aim】</p> <p>Students will acquire the fundamental methodology of molecular pathology research. Furthermore, they will learn additional techniques of collection and preservation of the cell and fresh tissue samples, the nucleic acid extraction and purification, laser-capture microdissection, polymerase chain reaction (PCR), reversed transcriptase-PCR (RT-PCR) and loss of heterozygosity (LOH).</p> <p>【Attainment target】</p> <p>Student will understand this course as follows;</p> <ul style="list-style-type: none"><li>・ be able to collect and preserve for the cell and fresh tissue samples</li><li>・ be able to extract and purify the nucleic acid from cell and tissue samples</li><li>・ be able to work on PCR and RT-PCR by the laser-capture microdissection</li><li>・ be able to explain the methodology and perform experimental procedure of loss of heterozygosity (LOH) analysis</li></ul> <p>【Study method・attention】</p> <p>Lecture, seminar and practice. To prepare for the class, students need to read reference textbooks and papers.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	04/07	Guidance	The details will be given in class		Jun-ichi Tanuma
2-5	04/14 04/21 04/28 05/12	Collection and preservation of the cell and fresh tissue samples, and DNA & RNA extraction and purification 1-4	Textbook1 pp27-43 Textbook1 pp63-67		Tatsuya Abé Jun-ichi Tanuma

6-7	05/19 05/26	Polymerase chain reaction (PCR) 1-2	Textbook1 pp68-81	Tatsuya Abé Jun-ichi Tanuma
8-9	06/02 06/09	Electrophoresis 1-2	Textbook1 pp68-81	Tatsuya Abé Jun-ichi Tanuma
10-11	06/16 06/23	Quantitative Real time PCR 1-2	Textbook1 pp179-185	Tatsuya Abé Jun-ichi Tanuma
12-14	06/30 07/07 07/14	Loss of heterozygosity (LOH) analysis 1-3	Textbook1 pp176-178	Tatsuya Abé Jun-ichi Tanuma
15	07/28	Summary	Review of Practice	Jun-ichi Tanuma
16	08/04	Examination	The details will be given in class	Jun-ichi Tanuma

#### 【Evaluation】

Examination (30%), Handing in papers (30%) and oral examinations (40%)

#### 【Media】

Textbook 1: Mouse Lab manual (2nd ed.) (Springer Co., Ltd.) 8,000 yen

#### 【Reference book】

Molecular Biology of Cancer (3rd ed.) (Medical • Science • International Pub., Inc.) 4,800 yen

#### IB • IIB

#### 【Course outline】

Seminar on the molecular biological experimental methods for oral pathological research course is that it deals with the essential knowledge and research technique on molecular pathology for elucidating the mechanism of the pathogenesis, progresses and outcomes of various diseases in oral and maxillofacial region by lectures and practices.

#### 【Course aim】

Students will learn additional techniques of collection and preservation of the cell and fresh tissue samples, DNA sequencing, *in situ* hybridization, fluorescence *in situ* hybridization (FISH), and immunohistochemistry.

#### 【Attainment target】

Student will understand this course as follows;

- be able to collect and preserve for the cell and fresh tissue samples
- be able to extract and purify the nucleic acid from cell and tissue samples
- be able to understand DNA sequencing
- be able to do *in situ* hybridization
- be able to understand fluorescence *in situ* hybridization (FISH)
- be able to do immunohistochemical staining and immunofluorescence staining

#### 【Study method・attention】

Lecture, seminar and practice. To prepare for the class, students need to read reference textbooks and papers.

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/06	Guidance	The details will be given in class	Jun-ichi Tanuma
2-5	10/13 10/20 10/27 11/10	DNA sequencing 1-4	Textbook1 pp171-175	Tatsuya Abé Jun-ichi Tanuma
6-7	11/17 11/24	<i>in situ</i> hybridization 1-2	Textbook1 pp194-219	Tatsuya Abé Jun-ichi Tanuma
8-9	12/01 12/08	Fluorescence <i>in situ</i> hybridization 1-2	Textbook1 pp108-133	Tatsuya Abé Jun-ichi Tanuma
10-11	12/15 12/22	Immunohistochemical staining and immunofluorescence staining 1-2	Textbook2 pp248-266	Tatsuya Abé Jun-ichi Tanuma
12-14	01/12 01/19 01/26	Immunofluorescence staining 1-2	Textbook2 pp248-266	Tatsuya Abé Jun-ichi Tanuma
15	02/02	Summary	Review of lectures	Jun-ichi Tanuma
16	02/09	Examination	The details will be given in class	Jun-ichi Tanuma
<p><b>【Evaluation】</b> Examination (30%), Handing in papers (30%) and oral examinations (40%)</p> <p><b>【Media】</b> Textbook 1: Mouse Lab manual (2nd ed.) (Springer Pub., Inc.) 8,000 yen Textbook 2: Pathology and Clinical Medicine Vol.25 (Bunkodo Co., Ltd.) 8,400 yen</p> <p><b>【Reference book】</b> Molecular Biology of Cancer (3rd ed.) (Medical・Science・International Pub., Inc.) 4,800 yen</p> <p><b>【Reference website】</b> Div. of Oral Pathology HP: <a href="http://www5.dent.niigata-u.ac.jp/~opatho/">http://www5.dent.niigata-u.ac.jp/~opatho/</a></p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5417	1	Tue/6・IA	2	9014	Seminar
230N5419		Tue/6・IIA			
230N5418	2	Tue/6・IB	2	9015	Seminar
230N5420		Tue/6・IIB			
Course	Clinical oral pathology diagnostics seminars IA, IIA, IB, IIB				
Instructor	Lecturer Satoshi Maruyama, Lecturer Manabu Yamazaki				
Place	Division of Oral Pathology				
IA・IIA					
<b>【Course outline】</b> This course deals with the methodology for research on pathogenesis of oral and maxillofacial diseases from the aspect of clinical pathology diagnostics. Modern trends in molecular biology technology which should be applied in pathological research on oral and maxillofacial diseases will be lectured.					
<b>【Course aim】</b> In this course, students will understand the pathogenesis of oral and maxillofacial diseases, from their causative factors, generation mechanism, clinical processes, to prognoses. Clinic-pathological aspects of their diagnostic criteria will be emphasized towards the end of their prevention and treatments.					
<b>【Attainment target】</b> Understanding various clinical characteristics of oral and maxillofacial diseases Understanding possible pathogenetic processes of oral and maxillofacial diseases					
<b>【Study method・attention】</b> Lecture and discussion. To prepare for the class, students need to read reference textbooks and papers.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance	The details tell by a class		Maruyama S Yamazaki M
2-3	4/18, 4/25	Practice for tooth and periodontal tissue lesions 1-2	Textbook① pp49-159		Maruyama S
4-6	5/2, 5/9, 5/16	Practice for oral mucosal lesions 1-3	Textbook ① pp331-401		Maruyama S Yamazaki M
7-9	5/23, 5/30, 6/6	Practice for salivary gland lesions 1-3	Textbook ① pp422-465		Maruyama S
10-11	6/13, 6/20	Practice for odontogenic lesions 1-2	Textbook ① pp632-681		Maruyama S Yamazaki M
12-13	6/27, 7/4	Practice for jaw and temporomandibular	Textbook ① pp572-		Maruyama S

		lesions 1-2	622	
14-15	7/11, 7/18	Practice for mesenchymal soft tissue lesions 1-2	Textbook ① pp473-525	Maruyama S Yamazaki M
16	7/25	Summary and Examination	Review until the last time	Maruyama S
<p><b>【Evaluation】</b> Handing in papers or oral examinations or written examinations (50% each)</p> <p><b>【Media】</b> ① Oral and Maxillofacial Pathology (3<sup>th</sup> edition; Bead W. Neville, et al, Elsevier.), 20,000yen</p> <p><b>【Reference book】</b> Related research papers</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course deals with the methodology for research on pathogenesis of oral and maxillofacial diseases from the aspect of clinical pathology diagnostics. Modern trends in molecular biology technology which should be applied in pathological research on oral and maxillofacial diseases will be lectured.</p> <p><b>【Course aim】</b> In this course, students will understand the pathogenesis of oral and maxillofacial diseases, from their causative factors, generation mechanism, clinical processes, to prognoses. Clinic-pathological aspects of their diagnostic criteria will be emphasized towards the end of their prevention and treatments.</p> <p><b>【Attainment target】</b> Distinguishing clinicopathological features for oral and maxillofacial diseases Understanding clinical and pathological diagnostic issues on of oral and maxillofacial diseases Understanding possible prevention strategies against of oral and maxillofacial diseases</p> <p><b>【Study method・attention】</b> Lecture and discussion. To prepare for the class, students need to read reference textbooks and papers.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Guidance	The details tell by a class	Maruyama S Yamazaki M
2-3	10/10, 10/17	Practical training for tooth and periodontal tissue lesions 1-2	Textbook① pp49-159	Maruyama S
4-6	10/24, 10/31, 11/7	Practical training for oral mucosal lesions 1-3	Textbook ① pp331-401 Textbook ② pp105-120	Maruyama S Yamazaki M
7-9	11/14, 11/21, 11/28	Practical training for salivary gland lesions 1-2	Textbook ② pp159-201	Maruyama S

10-11	12/5, 12/12	Practical training for odontogenic lesions 1-2	Textbook ② pp203-241	Maruyama S Yamazaki M
12-13	12/19, 12/26	Practical training for jaw and temporomandibular lesions 1-2	Textbook ② pp246-260	Maruyama S
14-15	1/16, 1/23	Practical training for mesenchymal soft tissue lesions 1-2	Textbook ② pp121-131	Maruyama S Yamazaki M
16	1/30	Summary and Examination	Review until the last time	Maruyama S

**【Evaluation】**

Handing in papers or oral examinations or written examinations (50% each)

**【Media】**

① Oral and Maxillofacial Pathology (4<sup>th</sup> edition; Bead W. Neville, et al, Elsevier.), 20,000 円

② WHO Classification of Head and neck Tumors. (4<sup>th</sup> edition; Adel K. El-Naggar, et al, IARC.), 20,000 円

**【Reference book】**

Related research papers



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5421	1	Fri/5・IA	2	9014	Lecture・Seminar (face-to-face class)
230N5423		Fri/5・IIA			
230N5422	2	Fri/5・IB	2	9015	Lecture・Seminar (face-to-face class)
230N5424		Fri/5・IIB			
Course	Seminar on oral clinical cytology IA, IIA, IB, IIB				
Instructor	Lecturer Manabu Yamazaki, Lecturer Satoshi Maruyama				
Place	Laboratory room of Division of Oral Pathology				
IA・IIA					
【Course outline】 In this seminar, the pathogenesis of various diseases occurring in the oral and maxillofacial region will be outlined, and lectures and practices will be given on the basic knowledge and techniques of cytological diagnostics.					
【Course aim】 The purpose of this course is to learn histopathological and cytological findings of various diseases of the oral and maxillofacial region through lectures and seminars and to understand the significance of pathological screening and diagnostic studies.					
【Attainment target】 ・To be able to understand the significance and indications of cytology for oral and maxillofacial diseases. ・To be able to understand cellular findings in various diseases. ・To be able to understand how to observe cytological specimens.					
【Study method・attention】 Lecture, seminar, and practice. To prepare for the class, students need to read textbooks and papers.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	04/07	Guidance	The details will be given in class		Yamazaki
2-3	04/14 04/21	Introduction of clinical cytology 1-2	Textbook 1, pp2-8 Textbook 2, pp1-50		Yamazaki
4-5	04/28 05/12	Cytological procedures of sampling, preparation, and staining 1-2	Textbook 1, pp10-20 Textbook 2, pp51-83		Yamazaki
6-7	05/19 05/26	Observation of cytological specimens Findings of normal oral mucosal cells	Textbook 1, pp21-30 Textbook 2, pp87-104		Yamazaki
8-9	06/02 06/09	Infectious diseases in oral and maxillofacial regions	Textbook 1, pp38-78		Maruyama
10-11	06/16	Non-neoplastic diseases of oral mucosa	Textbook 1, pp38-78		Maruyama

	06/23			
12-13	06/30 07/07	Neoplastic diseases of oral mucosa and oral Bethesda system	Textbook 1, pp32-63	Maruyama
14-15	07/14 07/21	Diseases of salivary glands and the Milan system	Textbook 1, pp80-93	Maruyama
16	07/28	Summary and examination	The details will be given in class	Yamazaki

#### 【Evaluation】

Examination or oral examination (50%), Handing in papers (50%)

#### 【Media】

Textbook 1: Oral Cytology (1st ed.) (Ishiyaku Pub., Inc.) 6,000 yen

Textbook 2: Cytology for the Beginners (5th ed.) (IGAKU-SHOIN Ltd.) 9,800 yen

#### 【Reference book】

References will be given in class.

### IB・IIB

#### 【Course outline】

In this seminar, the pathogenesis of various diseases of the oral and maxillofacial region and major organs of the body will be outlined, and lectures and practice will be given on the basics of cytological diagnostics and its application to pathological research.

#### 【Course aim】

Students will learn histopathological and cytological findings of various diseases mainly in the oral and maxillofacial region, understand the significance of screening and diagnosis, and aim to provide feedback to clinical oral surgery and develop applications in pathological research.

#### 【Attainment target】

- To be able to understand the significance and indications of cytology in the oral and maxillofacial regions and organs of the body.
- To be able to understand cellular findings in various diseases.
- To be able to understand the observation and evaluation of cytological specimens.
- To be able to practice various experimental methods using cytological specimens.

#### 【Study method・attention】

Lectures, seminars using specimens, and discussions will be given. Preparation with handouts and reference books is required.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/06	Guidance	The details will be given in class	Yamazaki
2-3	10/13 10/20	Neoplastic diseases of oral mucosa 1-2	Textbook 1, pp32-63	Maruyama
4-5	10/27	Odontogenic tumors 1-2	Textbook 1, pp94-96	Maruyama

	11/10			
6-7	11/17 11/24	Salivary gland tumors 1-2	Textbook 1, pp80-93	Maruyama
8-9	12/01 12/08	Cytology in systemic organs (Gynecological and respiratory systems)	Textbook 2, pp130-203	Yamazaki
10-11	12/15 12/22	Cytology in systemic organs (Other than gynecological and respiratory systems)	Textbook 2, pp228-350	Yamazaki
12-13	01/12 01/19	Immunocytochemistry on cytological specimens 1-2	The details will be given in class	Maruyama
14-15	01/26 02/02	Gene extraction methods from cytological specimens 1-2	The details will be given in class	Yamazaki
16	02/09	Summary and examination	The details will be given in class	Yamazaki

**【Evaluation】**

Examination or oral examination (50%), Handing in papers (50%)

**【Media】**

Textbook 1: Oral Cytology (1st ed.) (Ishiyaku Pub., Inc.) 6,000 yen

Textbook 2: Cytology for the Beginners (5th ed.) (IGAKU-SHOIN Ltd.) 9,800 yen

**【Reference book】**

References will be given in class.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5425	1	Tue／3・IA	2	9014	Lecture・Practice
230N5427		Wed／5・IIA			
230N5426	2	Thu／3・IB	2	9015	Lecture・Practice
230N5428		Fri／5・IIB			
Course	Practice for skeletal regeneration IA, IIA (featuring “basic PRP and PRF” ) Practice for skeletal regeneration IB, IIB (featuring “advanced PRP and PRF” )				
Instructor	Assoc. Prof. Tomoyuki Kawase				
Place	Small meeting rooms or Labs in the Research Collaboration and Promotion or Online lecture				
IA・IIA					
<b>【Course outline】</b> This course IA・IIA provides basic knowledge and techniques (e.g., cell processing, quality control, and assurance) required for the preparation of PRP and PRF that have been widely used for skeletal regenerative therapies in periodontology and related maxillofacial regions.					
<b>【Course aim】</b> We focus on platelet concentrates used for regenerative medicine and lecture on the basic concept from biomedical and industrial points of view. Thus, first, the student is required to understand the historical background of their development and the concepts of PRP and PRF. Second, the student is required to master how to prepare PRP and PRF. The student is expected to well understand the foundation for skeletal tissue engineering.					
<b>【Attainment target】</b> Among various cell-based medicinal products (CBMPs), blood is the most easily accessible source of biomaterial. In addition, platelet-concentrates have been well applied in clinical settings. Therefore, we use PRP/PRF as a representative CBMP. The student will learn its biological performance and quality. Furthermore, the student will learn also quality control and regulations. The course targets are to learn how to: 1) Explain the CBMP 2) Explain the manufacturing management 3) Explain the quality control 4) Master how to prepare PRP and PRF					
<b>【Study method・attention】</b> In addition to the Textbook published by Marx, we will provide our original textbook, including our published review articles, and give lectures and hands-on seminars to students. Thus, students should study prior to the lecture/practice, and discuss the results they obtained in the practice. In this course, students are required to make a habit of evaluating individual achievements by themselves. Basically, the lecture will be delivered through Zoom online system and the practice will be done face-to-face: however, for some reason, the video regarding practice may be delivered instead of the face-to-face practice.					
<b>【Others】</b> The schedule and content can be rearranged flexibly to meet the student’s personal schedule and need. Please ask. If the student has the plan to study or introduce PRP/PRF in his/her research, I will accept consultation					

and confidentially give some advice to him/her.				
【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	4/11 4/12	The historical background and biological basis of ATMP (Lecture) (Meeting)	The details are indicated in the class	Kawase T
2	4/18 4/19	Introduction of platelet concentrates: Their historical background and basic characteristics (Lecture) (Meeting)	Media ① and ②	Kawase T
3	4/25 4/26	Platelet-rich plasma (Lecture) (Zoom)	Media ①	Kawase T
4	5/2 5/10	Preparation of platelet-rich plasma and its quality assessment (Practice) (Meeting)	Preparation using the documents delivered previously	Kawase T
5	5/9 5/17	Platelet-rich fibrin (Lecture) (Zoom)	Media ②	Kawase T
6	5/16 5/24	Preparation of platelet-rich fibrin and its quality assessment (Practice) (Meeting)	Preparation using the documents delivered previously	Kawase T
7	5/23 5/31	Trends in platelet concentrate study (1) (Lecture) (Zoom)	Reference ⑩	Kawase T
8	5/30 6/7	Anticoagulants and platelet recovery rate (Practice) (Meeting)	Media ②	Kawase T
9	6/6 6/14	“Dental and Craniofacial Applications of Platelet-Rich Plasma” (Student-centered journal club style) (1) (Lecture) (Zoom)	Media ①	Kawase T
10	6/13 6/21	Novel platelet concentrate derivatives: iPRF and BioPRF (Practice) (Meeting)	Preparation using the documents delivered previously, Media ②	Kawase T
11	6/20 6/28	“Dental and Craniofacial Applications of Platelet-Rich Plasma” (Student-centered journal club style) (2) (Lecture) (Zoom)	Media ①	Kawase T
12	6/27 7/5	Trends in platelet concentrate study (2) (Lecture) (Zoom)	Preparation using the documents delivered previously	Kawase T
13	7/4 7/12	“Dental and Craniofacial Applications of Platelet-Rich Plasma” (Student-centered journal	Media ①	Kawase T

		club style) (3) (Lecture) (Zoom)		
14	7/11 7/19	Trends in platelet concentrate study (3) (Lecture) (Zoom)	Preparation using the documents delivered previously	Kawase T
15	7/18 7/26	“Dental and Craniofacial Applications of Platelet-Rich Plasma” (Student-centered journal club style) (4) (Lecture) (Zoom)	Media ①	Kawase T
16	7/25 8/2	Presentation and conclusion (Meeting)	Media ① and ②	Kawase T

#### 【Evaluation】

The examination will be done face-to-face. Your grades will be evaluated by Presentation 20%, Idea and proposal 20%, Report 20%, Attitude 20%, Technical exam 20%.

#### 【Media】 The texts below will be provided upon your request.

- ① “Dental and Craniofacial Applications of Platelet-Rich Plasma, 1<sup>st</sup> Edition” by Robert E. Marx (Author), Arun K. Garg (Author), Quintessence Pub Co, \$67.00
- ② “Understanding Platelet-Rich Fibrin” Ed: Richard Miron (section ed. Kawase T) Quintessence publishing, \$168.00

#### 【Reference book】

- ① Kawase T. Platelet-rich plasma and its derivatives as promising bioactive materials for regenerative medicine: Basic principles and concepts underlying recent advances. Odontology 103:126-135; 2015.
- ② “Autologous Blood Concentrates” by Arun K. Garg, \$170.39
- ③ “Platelet Rich Fibrin in Regenerative Dentistry: Biological Background and Clinical Indications, 1st Edition” Ed: Richard Miron and Joseph Choukroun, Wiley-Blackwell, ¥12,624
- ④ Kawase T. Platelet-rich plasma and its derivatives as promising bioactive materials for regenerative medicine: Basic principles and concepts underlying recent advances. Odontology 103:126-135; 2015.
- ⑤ Kawase T, Tanaka T. An updated proposal for terminology and classification of platelet-rich fibrin. Regen Ther 7:80-81; 2017.
- ⑥ Kawase T, Okuda K. Comprehensive quality control of the regenerative therapy using platelet concentrates: The current situation and prospects in Japan. BioMed Res Int Volume 2018, Article ID 6389157.
- ⑦ Kawase T, Takahashi A, Watanabe T, Tsujino T. Proposal for point-of-care testing of PRP quality. Int J Growth Factors Stem Cells Dent 2(1):13-17; 2019.
- ⑧ Kawase T, Mubarak S, Mourao CF. The Platelet Concentrates Therapy: From the Biased Past to the Anticipated Future

### IB・IIB コース

#### 【Course outline】

This course IB・IIB provides basic knowledge, evidence for clinical application and techniques (e.g., cell processing, quality control, and assurance) required for the preparation of PRP and PRF that have been widely used for skeletal regenerative therapies in periodontology and related maxillofacial regions.

#### 【Course aim】

We focus on platelet-concentrates used for regenerative medicine and explain their clinical application in regenerative therapy. We also provide an opportunity to predict the future cell-therapy through overview of global guidelines for advanced cell medicinal products and the domestic regulatory frameworks. The student is expected to well understand the foundation and application for skeletal tissue engineering.

**【Attainment target】**

Among various cell-based medicinal products (CBMPs), blood is the most easily accessible source of biomaterials. In addition, platelet-concentrates have been frequently applied in clinical settings. Therefore, we use PRP/PRF as a representative CBMP. The student will learn about their biological performance and quality. Furthermore, the student will learn also quality control and regulations. The targets of this course are to learn how to:

- 1) Master how to prepare PRP and PRF
- 2) Explain the differences between PRP and PRF in terms of their clinical outcomes
- 3) Explain a new regulatory framework of regenerative medicine in Japan
- 4) Explain basic matters regarding the production of CBMPs and medical care using CBMPs

**【Study method attention】**

In addition to the Textbook published by Marx, we will provide our original textbook, including our published review articles, and give lectures and hands-on seminars to students. Thus, students should study prior to the lecture/seminar, and discuss the results they obtained in the practice. In this course, students are required to make a habit of evaluating individual achievements by themselves. Basically, the lecture will be delivered through Zoom online system and the practice will be done face-to-face: however, for some reason, the video regarding practice may be delivered instead of the face-to-face practice.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5 10/6	The historical background and biological basis of ATMP (Lecture) (Meeting)	The details are indicated in the class	Kawase T
2	10/12 10/13	Act on the Safety of Regenerative Medicine and the regulatory framework of platelet concentrates (Lecture) (Meeting)	Reference ②	Kawase T
3	10/19 10/20	Global standardization of preparation protocols of autologous platelet concentrates (Lecture) (Zoom)	Media ① and ②	Kawase T
4	10/26 10/27	Protocols of preparation of PRP derivatives (Practice) (Meeting)	Preparation using the documents delivered previously	Kawase T
5	11/2 11/10	Protocols of preparation of PRF derivatives (Practice) (Meeting)	Preparation using the documents delivered previously	Kawase T
6	11/9 11/17	Protocols of preparation of other platelet concentrates (Practice) (Meeting)	Preparation using the documents delivered previously	Kawase T
7	11/16 11/24	Pre-clinical study of PRP/PRF preparations (Lecture) (Zoom)	Preparation using the documents delivered previously	Kawase T

8	11/30 12/1	“Understanding Platelet-Rich Fibrin” (Student-centered journal club style) (1) (Lecture) (Zoom)	Media ②	Kawase T
9	12/7 12/8	“Understanding Platelet-Rich Fibrin” (Student-centered journal club style) (2) (Lecture) (Zoom)	Media ②	Kawase T
10	12/14 12/15	Trends in platelet concentrate study (2) (Lecture) (Zoom)	Preparation using the documents delivered previously	Kawase T
11	12/21 12/22	“Understanding Platelet-Rich Fibrin” (Student-centered journal club style) (3) (Lecture) (Zoom)	Media ②	Kawase T
12	1/11 1/12	“Understanding Platelet-Rich Fibrin” (Student-centered journal club style) (4) (Lecture) (Zoom)	Media ②	Kawase T
13	1/18 1/19	Trends in platelet concentrate study (3) (Lecture) (Zoom)	Preparation using the documents delivered previously	Kawase T
14	1/25 1/26	“Understanding Platelet-Rich Fibrin” (Student-centered journal club style) (5) (Lecture) (Zoom)	Media ②	Kawase T
15	2/1 2/2	Presentation and conclusion (Meeting)	Media ① and ②	Kawase T
16	2/8 2/9	Examination (Meeting)	Review of the previous classes	Kawase T

#### 【Evaluation】

The examination will be done face-to-face. Your grades will be evaluated by Presentation 20%, Idea and proposal 20%, Report 20%, Attitude 20%, Technical exam 20%.

【Media】 The texts below will be provided upon your request.

- ① “Dental and Craniofacial Applications of Platelet-Rich Plasma 1st Edition” by Robert E. Marx (Author), Arun K. Garg (Author), \$67.00
- ② “Understanding Platelet-Rich Fibrin” Ed: Richard Miron (section ed: Kawase T) Quintessence publishing, \$138.00

#### 【Reference book】

- ① “Platelet Rich Fibrin in Regenerative Dentistry: Biological Background and Clinical Indications, 1st Edition” Ed: Richard Miron and Joseph Choukroun, Wiley-Blackwell, ¥12,624
- ② Kawase T, Okuda K. Comprehensive quality control of the regenerative therapy using platelet concentrates: The current situation and prospects in Japan. BioMed Res Int Volume 2018, Article ID 6389157.
- ③ Kawase T, Takahashi A, Watanabe T, Tsujino T. Proposal for point-of-care testing of PRP quality. Int J Growth Factors Stem Cells Dent 2(1):13-17; 2019.



Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5429	1	Thu/1 IA	2	IA・IIA	lecture
230N5431		Thu/6 IIA			
230N5430	2	Thu/1 IB	2	IA・IIA	lecture
230N5432		Thu/6 IIB			
Course	Seminar on the Reconstruction of Occlusal Functioning IA, IIA, IB, IIB				
Instructor	Associate Prof. Kazuhiro Hori (Div. Comprehensive Prosthodontics) Assistant Prof. Kazuhiro Murakami (Div. Comprehensive Prosthodontics)				
Place	Laboratory of Div. Comprehensive Prosthodontics				
IA・IIA					
【Course outline】 This course work includes the lecture and critical reading of related articles, which provides knowledge for diagnosing functional problems such as masticatory, swallowing and articulatory disorders and for applying an adequate prosthodontic approach to patients with maxillofacial defect or systemic disease.					
【Course aim】 Recent diversity of functional disturbance, physical condition and living environment of patients has made the conventional system of prosthodontics based on the type of prosthesis less effective in our hyper-aged society. This course work of “Comprehensive prosthodontics” is established for training the professional clinician and researcher who can develop the innovative prosthodontic approach and collaboration with surrounding fields based on the objective functional diagnosis.					
【Attainment target】 1. To explain normal and abnormal aspect of mastication and swallowing. 2. To explain and perform the evaluation of masticatory function. 3. To explain the impact of masticatory and swallowing disorders on the quality of life. 4. To explain masticatory and swallowing disorders in oral cancer patients. 5. To explain masticatory and swallowing disorders in stroke patients. 6. To explain masticatory and swallowing disorders in neurologic disease patients.					
【Study method・attention】 Detail of preparation for each lecture will be shown in the first lecture. Students have to read recommended articles and textbook before the lecture.					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/6	Guidance			Kazuhiro Hori
2	4/13	From mastication to swallow; normal aspects		Reference book 1) Related articles	Kazuhiro Hori
3	4/20	Circulatory response during chewing		Reference book 1) Related articles	Kazuhiro Hori

4	4/27	Masticatory performance and health	Reference book 2) Related articles	Kazuhiro Hori
5	5/11	Masticatory behavior and health	Reference book 2) Related articles	Kazuhiro Hori
6	5/18	How to assess mastication (1) objective assessment	Reference book 2) Related articles	Kazuhiro Murakami
7	5/25	How to assess mastication (2) subjective assessment	Reference book 2) Related articles	Kazuhiro Murakami
8	6/1	How masticatory disability relates swallowing	Reference book 1,2) Related articles	Kazuhiro Murakami
9	6/8	Impact of masticatory-swallowing disability on QOL	Reference book 1,2) Related articles	Kazuhiro Murakami
10	6/15	Masticatory and swallowing disability in oral cancer patients (1)	Reference book 3-6) Related articles	Kazuhiro Hori
11	6/22	Masticatory and swallowing disability in oral cancer patients (2)	Reference book 3-6) Related articles	Kazuhiro Hori
12	6/29	Masticatory and swallowing disability in stroke patients (1)	Reference book 4-7) Related articles	Kazuhiro Hori
13	7/6	Masticatory and swallowing disability in stroke patients (2)	Reference book 4-7) Related articles	Kazuhiro Hori
14	7/13	Masticatory and swallowing disability in neurologic disease patients	Reference book 4-7) Related articles	Kazuhiro Murakami
15	7/20	Oral frailty and hypofunction	Reference book 4, 8)	Kazuhiro Hori
16	7/27	Examination		Kazuhiro Hori
<p><b>【Evaluation】</b></p> <ul style="list-style-type: none"> <li>• Written examination (50%) and report (30%)</li> <li>• Presentation in the critical reading (20%)</li> </ul> <p><b>【Media】</b></p> <p>The related references will be distributed</p> <p><b>【Reference book】</b></p> <ol style="list-style-type: none"> <li>1) 『新よくわかる顎口腔機能』(医歯薬出版)</li> <li>2) 『成人～高齢者向け 咀嚼機能アップ BOOK』(クインテッセンス出版)</li> <li>3) 『口腔中咽頭がんのリハビリテーション』(医歯薬出版)</li> <li>4) 『新版 摂食・嚥下機能改善と装置の作り方超入門』(クインテッセンス出版)</li> <li>5) 『嚥下障害の臨床』(医歯薬出版)</li> <li>6) 『嚥下障害の臨床 実践編』(医歯薬出版)</li> <li>7) 『疾患別に診る嚥下障害』(医歯薬出版)</li> </ol>				

**【Course outline】**

This course work includes the lecture and critical reading of related articles, which provides knowledge for diagnosing functional problems such as masticatory, swallowing and articulatory disorders and for applying an adequate prosthodontic approach to patients with maxillofacial defect or systemic disease.

**【Course aim】**

Recent diversity of functional disturbance, physical condition and living environment of patients has made the conventional system of prosthodontics based on the type of prosthesis less effective in our hyper-aged society. This course work of “Comprehensive prosthodontics” is established for training the professional clinician and researcher who can develop the innovative prosthodontic approach and collaboration with surrounding fields based on the objective functional diagnosis.

**【Attainment target】**

1. To explain the concept of removable denture designing.
2. To explain the morphological consideration of removable partial denture.
3. To explain the maintenance of removable denture in the long time course.
4. To explain the each appliance in the maxillofacial prosthetics.
5. To explain the application of prosthesis in the rehabilitation medicine.
6. To explain the prosthodontic approach for elderly requiring long-term care
7. To explain the future research aspect of prosthodontics.

**【Study method・attention】**

Detail of preparation for each lecture will be shown in the first lecture.

Students have to read recommended articles and textbook before the lecture.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5	Design concept of removable denture (support, bracing and retention)	Reference 1,2) Additional material	Kazuhiro Hori
2	10/12	Morphological consideration of removable denture	Reference 1,2) Additional material	Kazuhiro Hori
3	10/19	Technical consideration of RPD (1) impression	Reference 1,2) Additional material	Kazuhiro Murakami
4	10/26	Technical consideration of RPD (2) maxillo-mandibular relationship	Reference 1,2) Additional material	Kazuhiro Murakami
5	11/2	Technical consideration of RPD (3) teeth arrangement, gum forming	Reference 1,2) Additional material	Kazuhiro Murakami
6	11/9	Maintenance of removable denture	Reference 1,2) Additional material	Kazuhiro Murakami
7	11/16	Maxillofacial prosthetics (1) maxillary obturator	Reference 3,4) Additional material	Kazuhiro Hori
8	11/30	Maxillofacial prosthetics (2) palatal augmentation prosthesis	Reference 3,4) Additional material	Kazuhiro Hori

9	12/7	Maxillofacial prosthetics (3) facial prosthesis	Reference 3,4) Additional material	Kazuhiro Hori
10	12/14	Prosthodontic approach in rehabilitation medicine (1)	Reference 4-8) Additional material	Kazuhiro Hori
11	12/21	Prosthodontic approach in rehabilitation medicine (2)	Reference 4-8) Additional material	Kazuhiro Hori
12	1/11	Prosthodontic approach for elderly requiring long-term care	Reference 4-8) Additional material	Kazuhiro Hori
13	1/18	Future research aspect (1) Diagnosis	Reference 5-9) Additional material	Kazuhiro Hori
14	1/25	Future research aspect (2) Treatment and rehabilitation	Reference 3-9) Additional material	Kazuhiro Hori
15	2/1	Future research aspect (3) Food science	Reference 9,10) Additional material	Kazuhiro Murakami
16	2/8	Examination		Kazuhiro Hori
<p><b>【Evaluation】</b></p> <ul style="list-style-type: none"> <li>• Written examination (50%) and report (30%)</li> <li>• Presentation in the critical reading (20%)</li> </ul> <p><b>【Media】</b></p> <p>The related references will be distributed</p> <p><b>【Reference book】</b></p> <ol style="list-style-type: none"> <li>1) 『無歯顎補綴治療学 第3版』(医歯薬出版)</li> <li>2) 『有床義歯補綴学』(永末書店)</li> <li>3) 『口腔中咽頭がんのリハビリテーション』(医歯薬出版)</li> <li>4) 『新版 摂食・嚥下機能改善と装置の作り方超入門』(クインテッセンス出版)</li> <li>5) 『成人～高齢者向け 咀嚼機能アップBOOK』(クインテッセンス出版)</li> <li>6) 『嚥下障害の臨床』(医歯薬出版)</li> <li>7) 『嚥下障害の臨床 実践編』(医歯薬出版)</li> <li>8) 『疾患別に診る嚥下障害』(医歯薬出版)</li> <li>9) 『新よくわかる顎口腔機能』(医歯薬出版)</li> <li>10) 『ヒトの感性に訴える製品開発とその評価』(技術情報協会)</li> </ol>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5433	1	Wed/1・IA	2	9014	Seminar
230N5435		Wed/7・IIA			
230N5434	2	Wed/1・IB	2	9015	Seminar
230N5436		Wed/7・IIB			
Course	Evaluation of Stomatognathic Function by Digital Devices IA, II A, I B, IIB				
Instructor	Associate Prof. Kazuhiro Hori (Div. Comprehensive Prosthodontics) Assistant Prof. Jumpei Okawa (Div. Comprehensive Prosthodontics)				
Place	Laboratory of Div. Comprehensive Prosthodontics				
IA・IIA					
<b>【Course outline】</b> The appropriate method for mastication and swallowing function should be selected, since the many organs including mandibular, tongue, larynx, and muscles should work coordinately for normal function. The course deals with the methodology for assessment of various organs related with mastication, swallowing and pronunciation.					
<b>【Course aim】</b> The course is designed to master the knowledge and technique for assessment of related organs which required for diagnosis of mastication and swallowing disorders.					
<b>【Attainment target】</b> The students will correctly understand physiology of related organs. The student will appropriately explain the examination for evaluation of stomatognathic function. The students will select and perform the examination needed according to the purpose. The students will list the needful examination according to the possible malfunction of mastication and swallowing.					
<b>【Study method・attention】</b> The students have to do a preparation for a lecture using textbooks or any source materials needed. Concrete contents of preparation for each lecture will be shown at the first class.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Introduction	Detail will be given in class.		Kazuhiro Hori
2	4/19	Property of various sensors	Prepare the textbook.		Kazuhiro Hori
3	4/26	Assessment of Tongue movement	Prepare the textbook.		Kazuhiro Hori
4-5	5/10, 17	Measurement of tongue pressure	Prepare the textbook.		Jumpei Okawa
6-7	5/24, 31	Measurement with manometry	Prepare the textbook.		Kazuhiro Hori
8	6/7	Assessment of jaw movement	Prepare the textbook.		Kazuhiro Hori

9-10	6/14, 21	Measurement of jaw movement	Prepare the textbook.	Kazuhiro Hori
11-12	6/28, 7/5	Analysis of jaw movement	Prepare the textbook.	Jumpei Okawa
13-14	7/12, 19	Motion capture	Prepare the textbook.	Jumpei Okawa
15-16	7/26, 8/2	Measurement of laryngeal movement	Prepare the textbook.	Kazuhiro Hori

#### 【Evaluation】

Oral test or written examination (50%) and report (50%).

#### 【Media】

Handout supplied by Div. Comprehensive Prosthodontics

#### 【Reference book】

新よくわかる顎口腔機能 咬合・摂食嚥下・発音を理解する（日本顎口腔機能学会編，医歯薬出版社）

ISBN978-4-263-44489-4, 8640 円

Research papers will be provided if needed.

#### IB・IIB

#### 【Course outline】

The appropriate method for mastication and swallowing function should be selected, since the many organs including mandibular, tongue, larynx, and muscles should work coordinately for normal function. The course deals with the methodology for clinical mastication and swallowing assessment using case example.

#### 【Course aim】

The course is designed to master the clinical knowledge and technique for stomatognathic function using result of actual clinical test.

#### 【Attainment target】

The students will correctly understand physiology of related organs.

The student will appropriately explain the examination for evaluation of stomatognathic function.

The students will select and perform the examination needed according to the purpose.

The students will list the needful examination according to the possible malfunction of mastication and swallowing.

#### 【Study method・attention】

The students have to do a preparation for a lecture using textbooks or any source materials needed. Concrete contents of preparation for each lecture will be shown at the first class.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Introduction	Detail will be given in class.	Kazuhiro Hori
2-3	10/11, 18	Assessment of coordination of related organs	Prepare the textbook.	Kazuhiro Hori
4-5	10/25 , 11/1	Simultaneous recording and analysis	Prepare the textbook.	Kazuhiro Hori
6-7	11/8, 15	Assessment of mastication	Prepare the textbook.	Jumpei Okawa
8	11/22	Measurement of occlusal force	Prepare the textbook.	Jumpei Okawa

9-10	11/29 , 12/6	Assessment of swallowing	Prepare the textbook.	Kazuhiro Hori
11-12	12/13, 20	Assessment of pronunciation	Prepare the textbook.	Kazuhiro Hori
13-14	1/10, 17	Assessment of QOL	Prepare the textbook.	Kazuhiro Hori
15-16	1/24, 31	Food texture and swallowing function	Prepare the textbook.	Jumpei Okawa
<p><b>【Evaluation】</b>  Oral test or written examination (50%) and report (50%).</p> <p><b>【Media】</b>  Handout supplied by Div. Comprehensive Prosthodontics</p> <p><b>【Reference book】</b>  新よくわかる顎口腔機能 咬合・摂食嚥下・発音を理解する（日本顎口腔機能学会編，医歯薬出版社）  ISBN978-4-263-44489-4, 8640 円  Research papers will be provided if needed.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5437	1	Wed/5・IA	2	9014	Lecture・Seminar
230N5439		Wed /6・IIA			
230N5438	2	Wed /5・IB	2	9015	Lecture・Seminar Practice
230N5440		Wed/6・IIB			
Course	Advanced Dental Implant Therapy I A, II A, I B, II B				
Instructor	Associate Prof. Yoshiaki Arai				
Place	Laboratory in Temporomandibular Joint and Oral Implant Clinic				
IA・IIA					
<p>【Course outline】</p> <p>This course deals with the care for edentulous patient by dental implant.</p> <p>【Course aim】</p> <p>The student will understand the therapeutic planning for edentulous patient by dental implant.</p> <p>【Attainment target】</p> <p>Able to understand the implant treatment for edentulous patient and the characteristic.</p> <p>Able to diagnosis a jaw bone of edentulous patient</p> <p>【Study method・attention】</p> <p>Lecture</p> <p>Analysis of data and learns diagnosis methods.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Guidance	The details are instructed in the class.		Arai
2-3	4/19 4/26	Implant treatment for edentulous patient	Textbook1, p29-50 Textbook1, p51-72		Arai
4-5	5/10 5/17	Implant over denture (IOD)	Textbook1, p91-115		Arai
6-7	5/24 5/31	Implant-Supported bridge	Textbook1, p116-123 Textbook1, p193-202		Arai
8-9	6/07 6/14	Concept of All-on-4	Textbook1, p177-192		Arai
10-11	6/21 6/28	Examination and Diagnosis of edentulous patient	Textbook1, p29-45		Arai
12-13	7/05 7/12	Analysis of CT images	Textbook1, p29-45		Arai



14	7/19	Computer Guided Implant Treatment	Textbook1, p203-212	Arai
15	7/26	Summary	The details are instructed in the class.	Arai
16	8/02	Examination	The details are instructed in the class.	Arai

#### 【Evaluation】

Attendance situation to a class (50%), presentation and discussion results (50%).

#### 【Media】

1. ITI Treatment Guide: Loading Protocols in Implant Dentistry Edentulous Patients. Wismeijer D. Buser D, Belser UC. 2010, Quintessence. ¥11,528.

#### 【Reference book】

1. Implant Overdentures: The Standard of Care for Edentulous Patients. Feine JS, Carlsson GE. 2003, Quintessence.
2. All-on-4® treatment concept Procedures manual. Nobel Biocare, free PDF.
3. Simplant Procedure Manual from scan, to plan, to guide. Dentsply, free PDF.
4. Video: <https://nobelbiocare-1.wistia.com/projects/wtlrhw011>

#### IB・IIB

#### 【Course outline】

This course deals with the care for edentulous patient by dental implant.

#### 【Course aim】

This course deals with the care for edentulous patient by dental implant.

#### 【Attainment target】

Able to make a therapeutic implant planning for edentulous patient.

Able to do the maintenance of edentulous implant-treated patients.

#### 【Study method・attention】

Lecture

Analysis of data and learns planning methods.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1-3	10/04 10/11 10/18	Computer simulation	Video: <a href="https://nobelbiocare-1.wistia.com/projects/wtlrhw011">https://nobelbiocare-1.wistia.com/projects/wtlrhw011</a>	Arai
4-6	10/25 11/01 11/08	Treatment planning	The details are instructed in the class.	Arai
7-9	11/15 11/22	Treatment	The details are instructed in the	Arai

	11/29		class.	
10	12/06	Complications	Textbook1, p213-236	Arai
11-13	12/13 12/20 1/10	Case Presentation	The details are instructed in the class.	Arai
14	1/17	Maintenance	The details are instructed in the class.	Arai
15	1/24	Summary	The details are instructed in the class.	Arai
16	1/31	Examination	The details are instructed in the class.	Arai

**【Evaluation】**

Attendance situation to a class (50%), presentation and discussion results (50%).

**【Media】**

1. ITI Treatment Guide: Loading Protocols in Implant Dentistry Edentulous Patients. Wismeijer D. Buser D, Belser UC. 2010, Quintessence. ¥11,528.

**【Reference book】**

1. Implant Overdentures: The Standard of Care for Edentulous Patients. Feine JS, Carlsson GE. 2003, Quintessence.
2. All-on-4® treatment concept Procedures manual. Nobel Biocare, free PDF.
3. Simplant Procedure Manual from scan, to plan, to guide. Dentsply, free PDF.
4. Video: <https://nobelbiocare-l.wistia.com/projects/wt1rwhwo11>

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5441	1	Tue/5・IA	2	9014	Seminar
230N5443		Tue /6・IIA			
230N5442	2	Tue /5・IB	2	9015	Seminar
230N5444		Tue /6・IIB			
Course	Seminar on Oral and Maxillofacial Tissue Reconstructive Surgery IA, IIA, IB, IIB				
Instructor	Asoc. Prof. Tadaharu Kobayashi				
Place	Conference Room in Div. Reconstructive Surgery for Oral and Maxillofacial Region, Clinic of Oral and Maxillofacial Surgery				
IA・IIA					
【Course outline】 The course is designed to learn and discuss about the theories and procedures about the diagnosis and surgical therapy for the tumor in oral and maxillofacial region including reconstructive surgery for tissue defect and application of tissue engineering and regenerative medicine.					
【Course aim】 The aim of this course is to obtain the basic knowledge surgical of resection and reconstruction of tumor in oral and maxillofacial region for oral and maxillofacial surgeons. Knowledge for tissue engineering and regenerative medicine should be understood.					
【Attainment target】 ・To explain and evaluate biopsy, imaging and the laboratory data for diagnosis and planning the treatments for tumor in oral and maxillofacial region. ・To explain indication and methods of tumor resection and reconstruction. ・To explain the concept of tissue engineering and its triad “cell”, “biomaterial as scaffold” and “signaling molecules”					
【Study method・attention】 This course consists of lecture and setting task of report and presentation. Students have to research beforehand using textbook or any academic resources. The contents of each preparation are presented at a first seminar.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Treatment of tumor in oral and maxillofacial region and tissue and functional reconstruction	The details are given in class		Kobayashi
2	4/18	Diagnosis and treatment planning for tumor in oral and maxillofacial region	The details are given in class		Kobayashi
3	4/25	Surgical resection of tumor in oral and maxillofacial region	The details are given in class		Kobayashi
4	5/2	Fundamental procedures and methods of tumor resection	The details are given in class		Kobayashi

5	5/9	Preoperative evaluation of tissue defect and function caused by tumor resection	The details are given in class	Kobayashi
6	5/16	Methods for reconstruction in oral and maxillofacial region	The details are given in class	Kobayashi
7	5/23	Planning and selection of reconstructive surgery and materials for reconstruction	The details are given in class	Kobayashi
8	5/30	Materials of reconstruction (Local flap)	The details are given in class	Kobayashi
9	6/6	Materials of reconstruction (Pedicule flap)	The details are given in class	Kobayashi
10	6/13	Materials of reconstruction (Vascularized free flap)	The details are given in class	Kobayashi
11	6/20	Materials of reconstruction (Biomaterial)	The details are given in class	Kobayashi
12	6/27	Oral rehabilitation using dental implants	The details are given in class	Kobayashi
13	7/4	Presentation 1	The details are given in class	Kobayashi
14	7/11	Presentation 2	The details are given in class	Kobayashi
15	7/18	Presentation 3	The details are given in class	Kobayashi
16	7/25	Examination	Review of the course	Kobayashi
<p><b>【Evaluation】</b>  Reports 10%, Presentation 40%, Examination 50%</p> <p><b>【Media】</b>  Takato T, Toduka Y: Stomatology (Asakura Shoten), ¥27,000</p> <p><b>【Reference book】</b>  An Atlas of Head and Neck Surgery, Lore JM and Medina JE, Elsevier Saunders. ¥22,790  Atlas of Regional and Free Flaps for Head and Neck Reconstruction, Urken ML, Cheney ML, Blackwell KE, Harris JR, Hadlock TA, Futran N, Wolters Kluwer / Lippincott Williams&amp;Wilkins. ¥30,799  New Trends In Tissue Engineering And Regenerative Medicine  - Official book of the Japanese society for regenerative medicine, Hibi H, Ueda M, INTECH</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b>  The course is designed to learn and discuss about the surgeries for tumor and reconstructive surgery for tissue defect after oral and maxillofacial cancer resection including application of tissue engineering and regenerative medicine.</p>				

<p><b>【Course aim】</b></p> <p>The aim of this course is to obtain the clinical procedure for surgical of resection and reconstruction of tumor in oral and maxillofacial region as a specialist of oral and maxillofacial surgeons. Tissue engineering and regenerative medicine should be also recognized as the method for reconstruction.</p> <p><b>【Attainment target】</b></p> <ul style="list-style-type: none"> <li>•To explain the clinical procedures about the materials and methods for oral and maxillofacial reconstruction.</li> <li>•To explain materials and methods for reconstruction, advantages and disadvantages of reconstructive methods as well as patients' care after the surgery.</li> <li>•To explain application of regenerative medicine to reconstructive surgery in oral and maxillofacial region including dental implant application.</li> </ul> <p><b>【Study method・attention】</b></p> <p>This course consists of lecture and setting task of report and presentation. Students have to research beforehand using textbook or any academic resources. The contents of each preparation are presented at a first seminar.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/3	Reconstructive surgery (tongue)	The details are given in class	Kobayashi
2	10/10	Reconstructive surgery (oral floor)	The details are given in class	Kobayashi
3	10/17	Reconstructive surgery (mandible)	The details are given in class	Kobayashi
4	10/24	Reconstructive surgery (maxilla and palate)	The details are given in class	Kobayashi
5	10/31	Reconstructive surgery and neck dissection	The details are given in class	Kobayashi
6	11/7	Postoperative complications and patients' care of reconstructive surgery	The details are given in class	Kobayashi
7	11/14	Evaluation after reconstructive surgery	The details are given in class	Kobayashi
8	11/21	Tissue engineering and regenerative medicine	The details are given in class	Kobayashi
9	11/28	Application of regenerative medicine to oral and maxillofacial region	The details are given in class	Kobayashi
10	12/5	Application of regenerative medicine to oral and maxillofacial region	The details are given in class	Kobayashi
11	12/12	Stem cell therapy for maxillofacial bone diseases including osteoporosis and osteonecrosis of jaw	The details are given in class	Kobayashi

12	12/19	Regenerative medicine of peripheral nerve	The details are given in class	Kobayashi
13	12/26	Presentation 1	The details are given in class	Kobayashi
14	1/16	Presentation 2	The details are given in class	Kobayashi
15	1/23	Presentation 3	The details are given in class	Kobayashi
16	1/30	Examination	Review of the course	Kobayashi

**【Evaluation】**

Reports 10%, Presentation 40%, Examination 50%

**【Media】**

Takato T, Toduka Y: Stomatology (Asakura Shoten), ¥27,000

**【Reference book】**

An Atlas of Head and Neck Surgery, Lore JM and Medina JE, Elsevier Saunders. ¥22,790

Atlas of Regional and Free Flaps for Head and Neck Reconstruction, Urken ML, Cheney ML, Blackwell KE, Harris JR, Hadlock TA, Futran N, Wolters Kluwer / Lippincott Williams&Wilkins. ¥30,799

New Trends In Tissue Engineering And Regenerative Medicine

- Official book of the Japanese society for regenerative medicine, Hibi H, Ueda M, INTECH

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5445	1	Wed/5・ⅠA	2	9014	Lecture
230N5447		Wed/6・ⅡA			
230N5446	2	Wed/5・ⅠB	2	9015	Lecture・Practice
230N5448		Wed/6・ⅡB			
Course	Seminar on Oral Oncology ⅠA, ⅡA, ⅠB, ⅡB				
Instructor	Prof. Tadaharu Kobayasi, Lecture Akinori Funayama				
Place	Conference Room in Div. Reconstructive Surgery for Oral and Maxillofacial Region, Clinic of Oral and Maxillofacial Surgery				
ⅠA・ⅡA					
【Course outline】 The course is designed to learn the anatomy of the maxillofacial and cervical region, epidemiology, etiology, histopathology, development, invasion, and metastasis by lecture and read the related literature for recognition of the nature of oral cancer.					
【Course aim】 The aim of this course is to provide introduction to the basic principle of oral cancer and its treatment, and presentation skills for oral cancer management.					
【Attainment target】 <ul style="list-style-type: none"><li>● Explain the anatomy of the oral region (oral mucosa, jawbone, vasculature, and nerves) where oral cancer occurs.</li><li>● Explain the epidemiology, etiology, and precancerous lesions and conditions of oral cancer.</li><li>● Explain the mechanism of oral cancer development, invasion and metastasis.</li></ul>					
【Study method・attention】 Refer to the textbook of general oncology and related literature and read the related literature of oral cancer					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Guidance	The details are given in class		Kobayashi
2	4/19	Anatomy of maxillofacial and cervical region	Textbook1 pp38-54		Kobayashi
3	4/26	Epidemiology of oral cancer (1): Etiology	Textbook2 pp1-7		Kobayashi
4	5/10	Epidemiology of oral cancer (2): Precancerous lesions and conditions	Textbook2 pp8-17		Kobayashi
5	5/17	Diagnosis of oral cancer: Histopathology and immunohistochemistry	Textbook3 pp12-17		Kobayashi
6	5/24	Summary and Evaluation (1)	Review of lecture No.		Kobayashi

			1-5	
7	5/31	Development of oral cancer: Multi-step cancerization	Textbook2 pp8-30	Funayama
8	6/7	Development of oral cancer: Field cancerization	Textbook2 pp31-37	Funayama
9	6/14	Invasion of oral cancer: Differentiation and pattern of invasion	Textbook2 pp66-98	Funayama
10	6/21	Invasion of oral cancer: Epithelial-mesenchymal transition (EMT)	Textbook3 pp213-215	Funayama
11	6/28	Metastasis of oral cancer (1): Invasion-metastasis cascade	Textbook3 pp215-222	Funayama
12	7/5	Metastasis of oral cancer (2): Lymph node and distant metastasis	Textbook2 pp98-106	Funayama
13	7/12	Treatment of oral cancer (1): Surgical treatment	Textbook3 pp647-668	Kobayashi
14	7/19	Treatment of oral cancer (2): Radiation therapy and Chemotherapy	Textbook3 pp668-685	Kobayashi
15	7/26	Treatment of oral cancer (3): molecular-targeted therapy	Textbook3 pp685-691	Kobayashi
16	8/2	Summary and Evaluation (2)	Review of all lectures	Kobayashi

#### 【Evaluation】

Clinical presentation and discussion are main events of evaluation (50%), and additionally the attendance of meeting (10%), and paper tests (40%).

#### 【Media】

- ①ORAL CANCER ;Diagnosis, Management, and Rehabilitation : John W. Werning, 13,911 円
- ②口腔癌取り扱い規約 (第2版), 金原出版, 3,800 円
- ③宮崎 正著: 口腔外科学(第4版), 医歯薬出版, 27,000 円

#### 【Reference book】

NCCN Guidelines Head and Neck Cancers.Version 2, 2022

#### IB・IIB

#### 【Course outline】

The course is designed to learn diagnostic methods, treatment planning and basic techniques for oral surgeons by lectures, trial practical training in out and/in patients, case presentations for oral diseases and oral cancers.

#### 【Course aim】

The aim of this course is to master diagnostic methods, principal knowledge and skills about oral cancer for general dentist and oral surgeon.

#### 【Attainment target】

- Perform taking the medical history for diagnosis of oro-facial diseases
- Perform the basic surgical practices; instruments handling, local anesthesia, tooth extraction, incision, suturing, and wound repair) for management of oral and maxillofacial diseases



<ul style="list-style-type: none"> <li>● Explain and evaluate the methods of diagnosis for oral cancers; biopsy techniques, vital staining, and imaging</li> <li>● Explain and planning the treatments for oral cancer; surgery, chemotherapy and radiotherapy</li> <li>● Explain the methods of assessment for swallowing and speech functions, and maxillofacial prosthetics</li> </ul> <p><b>【Study method・attention】</b></p> <p>Managements of out and/or In-patients</p> <p>Discussion and presentation of various cases of oral cancer</p> <p>The contents of each preparation are presented at a first seminar.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	The details are given in class	Kobayashi
2	10/11	Medical interview and physical examination	Textbook1 pp12-48	Kobayashi
3	10/18	Basic surgical procedures (1): Instruments, local anesthesia and extraction	Textbook2 pp1-21	Kobayashi
4	10/25	Basic surgical procedures (2): Incision, suture and wound management	Textbook2 pp23-90	Kobayashi
5	11/1	Principles of infection control and Evaluation (1)	Textbook1 pp487-494, Review of lecture No. 1-4	Kobayashi
6	11/8	Diagnosis of oral cancer (1): Biopsy and vital staining	Textbook3 pp114-128	Funayama
7	11/15	Diagnosis of oral cancer (2): Histopathology and immunohistochemistry	Textbook3 pp66-107	Funayama
8	11/22	Diagnosis of oral cancer (3): Various imaging modalities	Textbook3 pp42-65	Funayama
9	11/29	Treatment of oral cancer (1-1): Surgical treatment	Textbook4 pp78-179	Funayama
10	12/6	Treatment of oral cancer (1-2): method of reconstruction	Textbook4 pp180-236	Funayama
11	12/13	Treatment of oral cancer (2): Radiation therapy	Textbook4 pp237-250	Funayama
12	12/20	Treatment of oral cancer (3): Chemotherapy	Textbook4 pp251-261	Funayama
13	1/10	Treatment of oral cancer (4): Complications and its management	Textbook4 pp262-303	Funayama
14	1/17	Morphological and functional assessments: Swallowing and speech	Textbook4 pp304-308	Kobayashi
15	1/24	Reporting of cases, presentation and discussion.	Preparation for case	Kobayashi

			presentation	
16	1/31	Summary and Evaluation (2)	Review of all lectures	Kobayashi
<p><b>【Evaluation】</b></p> <p>Case presentation and discussion are main events of evaluation (50%), and additionally the attendance of meeting (10%), technique of simulated operation (10%) and paper tests (30%).</p> <p><b>【Media】</b></p> <p>①宮崎 正著：口腔外科学(第4版)，医歯薬出版，27,000 円</p> <p>②杉崎 正志編著：切開と縫合の基本と臨床，ヒョーロン・パブリッシャーズ，9,000 円</p> <p>③口腔癌取り扱い規約（第2版），金原出版，3,800 円</p> <p>④ORAL CANCER ; Diagnosis, Management, and Rehabilitation : John W. Werning, 13,911 円</p> <p><b>【Reference book】</b></p> <p>NCCN Guidelines Head and Neck Cancers.Version 2, 2022</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5449	1	Mon/5・IA	2	9014	Lecture
230N5451		Mon/7・IIA			
230N5450	2	Mon/5・IB	2	9015	Lecture・Practice
230N5452		Mon/7・IIB			
Course	Diagnosis and Treatment of Developmental Maxillofacial Anomalies IA, IIA, IB, IIB				
Instructor	Prof. Tadaharu Kobayashi				
Place	Conference Room in Div. Reconstructive Surgery for Oral and Maxillofacial Region, Clinic of Oral and Maxillofacial Surgery				
IA・IIA					
<b>【Course outline】</b> The course is designed to learn diagnostic methods and treatment planning for developmental maxillofacial anomalies.					
<b>【Course aim】</b> The aim of this course is to obtain basic knowledge and technique to diagnose and treat developmental maxillofacial anomalies as oral and maxillofacial surgeon.					
<b>【Attainment target】</b> ・To collect necessary materials and data for adequate diagnosis of developmental maxillofacial anomalies. ・To diagnose dentofacial morphology and malalignment of teeth from many materials and data. ・To make a plan of surgical orthodontic treatment.					
<b>【Study method・attention】</b> This cause consists of lecture using some documents, slides and moving images. Students have to do research beforehand using textbooks or any source materials. The contents of each preparation are presented at a first seminar.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/10	Clinical condition of developmental maxillofacial anomalies	The details are given in class		Kobayashi T
2	4/17	Pathogenesis of developmental maxillofacial anomalies	The details are given in class		Kobayashi T
3	4/24	Collection of necessary materials and data for diagnosis	The details are given in class		Kobayashi T
4	5/1	Cephalometric analysis 1	The details are given in class		Kobayashi T
5	5/8	Cephalometric analysis 2	The details are given in class		Kobayashi T

6	5/22	Computed tomography imaging 1	The details are given in class	Kobayashi T
7	5/29	Computed tomography imaging 2	The details are given in class	Kobayashi T
8	6/5	Analysis of facial photograph	The details are given in class	Kobayashi T
9	6/12	Analysis of dental cast	The details are given in class	Kobayashi T
10	6/19	Analysis of stomatognathic functions 1	The details are given in class	Kobayashi T
11	6/26	Analysis of stomatognathic functions 2	The details are given in class	Kobayashi T
12	7/3	Planning of surgical orthodontic treatment	The details are given in class	Kobayashi T
13	7/10	Simulation of orthognathic surgery 1	The details are given in class	Kobayashi T
14	7/24	Simulation of orthognathic surgery 2	The details are given in class	Kobayashi T
15	7/31	Presentation and conclusion	The details are given in class	Kobayashi T

#### 【Evaluation】

Oral test and clinical presentation

#### 【Media】

顎変形症治療アトラス 高橋庄二郎・黒田敬之・飯塚忠彦 編 医歯薬出版、23,000 円

#### 【Reference book】

Modern practice in orthognathic and reconstructive surgery Edited by William H Bell W.B. Saunders Company

#### IB・IIB

#### 【Course outline】

The course is designed to learn treatment planning, techniques of orthognathic surgeries and postoperative evaluation for developmental maxillofacial anomalies.

#### 【Course aim】

The aim of this course is to obtain basic knowledge and technique to treat developmental maxillofacial anomalies as oral and maxillofacial surgeon.

#### 【Attainment target】

- To explain techniques of orthognathic surgeries and the indications.
- To assist orthognathic surgeries and manage the patients.
- To make a postoperative assessment of surgical orthodontic treatment.

#### 【Study method・attention】

This cause consists of lecture using some documents, slides and moving images. Students have to do research

beforehand using textbooks or any source materials. The contents of each preparation are presented at a first seminar.				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/16	Orthognathic surgery 1 (Le Fort I osteotomy)	The details are given in class	Kobayashi T
2	10/23	Orthognathic surgery 2 (sagittal split ramous osteotomy)	The details are given in class	Kobayashi T
3	10/30	Orthognathic surgery 3 (segmental maxillary osteotomies and subapical mandibular osteotomies)	The details are given in class	Kobayashi T
4	11/13	Orthognathic surgery 4 (genioplasty)	The details are given in class	Kobayashi T
5	11/20	Orthognathic surgery 5 (distraction osteogenesis)	The details are given in class	Kobayashi T
6	11/27	Perioperative management 1 (respiratory management)	The details are given in class	Kobayashi T
7	12/4	Perioperative management 2 (intermaxillary fixation and nutritional management)	The details are given in class	Kobayashi T
8	12/11	Perioperative management 3 (paresthesia and eustachian tube function)	The details are given in class	Kobayashi T
9	12/18	Postoperative assessment 1 (postoperative maxillomandibular stability)	The details are given in class	Kobayashi T
10	12/25	Postoperative assessment 2 (temporomandibular joint function)	The details are given in class	Kobayashi T
11	1/9	Postoperative assessment 3 (masticatory function)	The details are given in class	Kobayashi T
12	1/15	Postoperative assessment 4 (respiratory function during sleep)	The details are given in class	Kobayashi T
13	1/22	Postoperative assessment 5 (psychological assessment)	The details are given in class	Kobayashi T
14	1/29	Postoperative assessment 6 (subjective evaluation)	The details are given in class	Kobayashi T
15	2/5	Presentation and conclusion	The details are given in class	Kobayashi T

**【Evaluation】**

Oral test and clinical presentation

**【Media】**

顎変形症治療アトラス 高橋庄二郎・黒田敬之・飯塚忠彦 編 医歯薬出版、23,000 円

**【Reference book】**

Modern practice in orthognathic and reconstructive surgery Edited by William H Bell W.B. Saunders Company

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5457	1	Thu／3・IA	2	9114	Lecture・Seminar
230N5459		Thu／6・IIA			
230N5458	2	Thu／3・IB	2	9115	Lecture・Seminar
230N5460		Thu／6・IIB			
Course	Oral and Maxillofacial Radiology IA, IIA, IB, IIB				
Instructor	Prof. Takafumi Hayashi (Div. Oral and Maxillofacial Radiology)				
Place	Laboratory in Div. Oral and Maxillofacial Radiology				
IA・IIA					
【Course outline】 In the field of dental practice, it is mandatory to recognize the image features of pathological status of the oral cavity. This course provides the typical imaging findings using various diagnostic imaging techniques.					
【Course aim】 In this course, learners are expected to learn the typical imaging findings of various lesions in the maxillofacial region using conventional x-ray, computed tomography (CT), cone-beam CT (CBCT), MR imaging (MRI), ultrasonography (US) and positron emission tomography (PET).					
【Attainment target】 1) To describe the imaging interpretation of the dental and periodontal diseases. 2) To describe the imaging interpretation of the congenital and developmental anomaly. 3) To describe the imaging interpretation of the systemic diseases. 4) To describe the imaging interpretation of the facial trauma. 5) To describe the imaging interpretation of the inflammatory disease. 6) To describe the imaging interpretation of the cystic lesion. 7) To describe the imaging interpretation of the benign neoplasms. 8) To describe the imaging interpretation of the malignant neoplasms. 9) To describe the imaging interpretation of the salivary gland diseases. 10) To describe the imaging interpretation of the fibro-osseous lesions. 11) To describe the imaging interpretation of the oral soft tissue lesions. 12) To describe the imaging interpretation of the soft tissue lesions of the neck. 13) To describe the imaging interpretation of the temporomandibular joint lesions. 14) To describe the imaging interpretation of the maxillary sinus diseases. 15) To describe the imaging interpretation of the miscellaneous diseases of the jaw bone.					
【Study method・attention】 Formative evaluation: pre and posttest. Lecture download website is provided. Real-time online lecture using Zoom would be provided. Computer device and internet access environment are required. <a href="https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/">https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/</a>					
【Plan】					
No.	Date	Contents		Out-of-Class Study	Instructor
1	4/6	Guidance of the course and the imaging		Summarization of	T. Hayashi

		interpretation of the dental and periodontal diseases (online)	textbook chapter 2	
2	4/13	The imaging interpretation of the congenital and developmental anomaly (online)	Summarization of textbook chapter 3	T. Hayashi
3	4/20	The imaging interpretation of the systemic diseases (online)	Summarization of textbook chapter 8	T. Hayashi
4	4/27	The imaging interpretation of the facial trauma (online)	Summarization of textbook chapter 3	T. Hayashi
5	5/11	The imaging interpretation of the inflammatory disease (online)	Summarization of textbook chapter 3	T. Hayashi
6	5/18	The imaging interpretation of the cystic lesion (online)	Summarization of textbook chapter 3	T. Hayashi
7	5/25	The imaging interpretation of the benign neoplasms (online)	Summarization of textbook chapter 3	T. Hayashi
8	6/1	The imaging interpretation of the malignant neoplasms (online)	Summarization of textbook chapter 3	T. Hayashi
9	6/8	The imaging interpretation of the salivary gland diseases (online)	Summarization of textbook chapter 6	T. Hayashi
10	6/15	The imaging interpretation of the fibro-osseous lesions (online)	Summarization of textbook chapter 3	T. Hayashi
11	6/22	The imaging interpretation of the oral soft tissue lesions (online)	Summarization of textbook chapter 7	T. Hayashi
12	6/29	The imaging interpretation of the soft tissue lesions of the neck (online)	Summarization of textbook chapter 7	T. Hayashi
13	7/6	The imaging interpretation of the temporomandibular joint lesions (online)	Summarization of textbook chapter 5	T. Hayashi
14	7/13	The imaging interpretation of the maxillary sinus diseases (online)	Summarization of textbook chapter 4	T. Hayashi



15	7/20	The imaging interpretation the miscellaneous diseases of the jaw bone (online)	Summarization of textbook chapter 3	T. Hayashi
16	7/27	Examination (face-to-face)	Review of the course	T. Hayashi

#### 【Evaluation】

Summative evaluation (90%): multiple-choice and open-ended tests.

Attitude in the lecture and interest in the field (10%).

#### 【Media】

Diagnostic imaging atlas in dental clinical practice (2nd ed.) Ishiyaku Publishers, Inc. (JPY 13,200 with tax)

#### 【Reference book】

Hiroya Ojiri. Head and Neck Imaging Fourth Edition. Nankodo. (JPY 19,800 with tax)

#### 【Related links】

<https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/>

### IB・IIB

#### 【Course outline】

In the field of dental practice, it is mandatory to recognize the image features of pathological status of the oral cavity. This course provides the advanced diagnostic imaging using various diagnostic imaging techniques.

#### 【Course aim】

In this course, learners are expected to perform the advanced diagnostic imaging of various lesions in the maxillofacial region using conventional x-ray, computed tomography (CT), cone-beam CT (CBCT), MR imaging (MRI), ultrasonography (US) and positron emission tomography (PET).

#### 【Attainment target】

- 1) To perform the diagnostic imaging of the dental and periodontal diseases.
- 2) To perform the diagnostic imaging of the congenital and developmental anomaly.
- 3) To perform the diagnostic imaging of the systemic disease.
- 4) To perform the diagnostic imaging of the facial trauma.
- 5) To perform the diagnostic imaging of the inflammatory disease.
- 6) To perform the diagnostic imaging of the cystic lesion.
- 7) To perform the diagnostic imaging of the benign neoplasms.
- 8) To perform the diagnostic imaging of the malignant neoplasms.
- 9) To perform the diagnostic imaging of the salivary gland diseases.
- 10) To perform the diagnostic imaging of the fibro-osseous lesions.
- 11) To perform the diagnostic imaging of the oral soft tissue lesions.
- 12) To perform the diagnostic imaging of the soft tissue lesions of the neck.
- 13) To perform the diagnostic imaging of the temporomandibular joint lesions.
- 14) To perform the diagnostic imaging of the maxillary sinus diseases.
- 15) To perform the diagnostic imaging of the miscellaneous diseases of the jaw bone.

#### 【Study method・attention】

Formative evaluation: pre and posttest. Lecture download website is provided. It is preferable to have completed IA or IIA courses.

Real-time online lecture using Zoom would be provided. Computer device and internet access environment are

required. <a href="https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/">https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/</a>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/5	Guidance of the course and the diagnostic imaging of the dental and periodontal diseases (online)	Summarization of textbook chapter 2	T. Hayashi
2	10/12	The diagnostic imaging of the congenital and developmental anomaly (online)	Summarization of textbook chapter 3	T. Hayashi
3	10/19	The diagnostic imaging of the systemic diseases (online)	Summarization of textbook chapter 8	T. Hayashi
4	10/26	The diagnostic imaging of the facial trauma (online)	Summarization of textbook chapter 3	T. Hayashi
5	11/2	The diagnostic imaging of the inflammatory disease (online)	Summarization of textbook chapter 3	T. Hayashi
6	11/9	The diagnostic imaging of the cystic lesion (online)	Summarization of textbook chapter 3	T. Hayashi
7	11/16	The diagnostic imaging of the benign neoplasms (online)	Summarization of textbook chapter 3	T. Hayashi
8	11/30	The diagnostic imaging of the malignant neoplasms (online)	Summarization of textbook chapter 3	T. Hayashi
9	12/7	The diagnostic imaging of the salivary gland diseases (online)	Summarization of textbook chapter 6	T. Hayashi
10	12/14	The diagnostic imaging of the fibro-osseous lesions (online)	Summarization of textbook chapter 3	T. Hayashi
11	12/21	The diagnostic imaging of the oral soft tissue lesions (online)	Summarization of textbook chapter 7	T. Hayashi
12	1/11	The diagnostic imaging of the soft tissue lesions of the neck (online)	Summarization of textbook chapter 7	T. Hayashi
13	1/18	The diagnostic imaging of the temporomandibular joint lesions (online)	Summarization of textbook chapter 5	T. Hayashi

14	1/25	The diagnostic imaging of the maxillary sinus diseases (online)	Summarization of textbook chapter 4	T. Hayashi
15	2/1	The diagnostic imaging the miscellaneous diseases of the jaw bone (online)	Summarization of textbook chapter 3	T. Hayashi
16	2/8	Examination (face-to-face)	Review of the course	T. Hayashi
<p><b>【Evaluation】</b>  Summative evaluation (90%): multiple-choice and open-ended tests.  Attitude in the lecture and interest in the field (10%).</p> <p><b>【Media】</b>  Diagnostic imaging atlas in dental clinical practice (2nd ed.) Ishiyaku Publishers, Inc. (JPY 13,200 with tax)</p> <p><b>【Reference book】</b>  Hiroya Ojiri. Head and Neck Imaging Fourth Edition. Nankodo. (JPY 19,800 with tax)</p> <p><b>【Related links】</b>  <a href="https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/">https://www5.dent.niigata-u.ac.jp/~radiology/postgraduate/</a></p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5461	1	Wed/4・IA (IB)	2	9014	Lecture・Seminar
230N5463		Wed/6・IIA (IIB)			
230N5462	2	Wed/4・IB (IA)	2	9015	Lecture・Seminar
230N5464		Wed/6・IIB (IIA)			
Course	Seminar on Diagnostic Imaging Practice in the Oral and Maxillofacial Region IA, IIA, IB, IIB				
Instructor	Associate Prof. Hideyoshi Nishiyama (Div. Oral and Maxillofacial Radiology)				
Place	Laboratory in Div. Oral and Maxillofacial Radiology, or each computer connected to the internet.				
IA・IIA					
【Course outline】					
CT and MRI images are processed by convolution filters and stored as DICOM images. If you want to diagnose and study about those images, you must learn about the image processing methods. In the beginning, this course provides the practices for handling of DICOM formatted images and for training in the image processing methods. Then, you can learn about making the MPR or ADC map from DICOM formatted images, and practice in the diagnostic imaging of oral and maxillofacial region using image processing.					
【Course aim】					
Students will acquire the knowledge and skills of image processing methods for diagnostic imaging of oral and maxillofacial region and to use them for some cases.					
【Attainment target】					
Students will diagnose the DICOM formatted images (CT, MRI etc.) with suitable image processing.					
1) Students will explain about DICOM and to understand about image formats and characteristics.					
2) Students will perform the digital image processing.					
3) Students will explain and make the MPR formatted images.					
4) Students will change the coordinate of any point on DICOM images with affine transformation method.					
5) Students will extract and analyze necessary information from DICOM tags for dynamic contrast enhanced images, DWI and ADC map.					
【Study method・attention】					
Course B requires students to take Course A. Autumn enrollees can take Course A in the second semester of this year and Course B in the first semester of the following year.					
If you decide to take this course, please contact me by E-mail to “ <a href="mailto:nisiyama@dent.niigata-u.ac.jp">nisiyama@dent.niigata-u.ac.jp</a> ”.					
This course is online based system. You can download the text and assignments from the following web site.					
Site URL for the Diagnostic Imaging Practice: <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>					
After doing assignments, you should send back the products by E-mail. After submission of products, you can download the answer and explication with the password. After reviewing the answers and explanations, do more self-study as needed.					
The image processing software as “ImageJ” (NIH: National Institutes of Health) or Fiji will be used in this practical course, but you can use other software that managing the DICOM format. Instructions for installing the software will be given during the first exercise.					

【Plan】				
No.	Date	Contents	Out-of-Class Study	Instructor
1	4/12	Guidance, About image processing software	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
2	4/19	About the tag information in DICOM data	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
3	4/26	About the image formats in DICOM data	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
4	5/10	About the 3D view and MPR on DICOM images.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
5	5/17	Problem of gantry (detector) tilt angle.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
6	5/24	About the line profile and measuring accuracy on CT images.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
7	5/31	About the filters (or kernels) for image processing on CT images.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
8	6/7	About the 2D affine transformation.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
9	6/14	About the 3D affine transformation (1).	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
10	6/21	About the 3D affine transformation (2).	Do the exercises of the day	H. Nishiyama

			<a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	
11	6/28	About the diagnostic imaging with affine transformation.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
12	7/5	About the diagnostic CT imaging with ROI.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
13	7/12	About the using of DICOM tag for diagnostic MR imaging.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
14	7/19	About the using of DICOM tag for diagnostic MR imaging with dynamic contrast enhancement.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
15	7/26	About the DWI, ADC map and water flow for the diagnostic MR imaging.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
16	8/2	Examination multi-choice objective test	Review of the course	H. Nishiyama

#### 【Evaluation】

The evaluation is performed by the multi-choice objective test (60%) and exercise submissions (40%).

The exam will be conducted using the "Mini Test" function of the campus web (campus portal) information system. Please note that all materials, online or offline, will be allowed to be referenced in order to assess practical skills rather than memorization. However, the act of inquiring or asking questions to others (including ChatGPT) and exchanging information between examinees are prohibited.

#### 【Media】

For manuals and reference materials related to ImageJ and Fiji, search and use on the web.

For example, see below:

<https://imagej.nih.gov/ij/docs/index.html>

<https://imagej.net/Cookbook>

In this course, CT and MRI texts are not specified. If the information on the web is insufficient, use text according to your ability as follows.

For MATLAB, please refer to online materials.

#### 【Reference book】

##### 1. Main reference books

Image Processing with ImageJ (Packt Publishing / By José María Mateos Perez, Javier Pascau) Paperback: about \$29.99 online shop.

##### 2. Recommended books

Digital Image Processing for Medical Applications (Cambridge University Press; 1 edition, May 11, 2009) Paperback: about \$13.86 online shop.

MRI: The Basics (English Edition) 4th Edition (Wolters Kluwer Health / by Ray H. Hashemi, Christopher J. Lisanti, William Bradley) about \$42.30 online shop.

Head and Neck Imaging (Expert Consult) 5th Edition (Mosby / by Peter M. Som MD, Hugh D. Curtin MD) about \$161.40 online shop.

## IB • IIB

### 【Course outline】

Deep learning in image recognition has recently attracted attention as an area that has evolved significantly in the history of artificial intelligence, especially machine learning systems. However, in deep learning systems based mainly on multilayer convolutional neural networks or Vision-Transformer (ViT), the image recognition method must be treated as a black box. For this reason, the Ministry of Health, Labor and Welfare and the Ministry of Internal Affairs and Communications continuously publish about accountability on the system development side and user responsibilities of doctors and dentists.

In this exercise, you will understand the mechanism and learn the applicable range and limitations through exercises on AI, machine learning, and deep learning in diagnostic imaging.

### 【Course aim】

By applying the knowledge of image processing acquired in Course A, especially the matrix operation used in affine transformation in three-dimensional space, and the concept of convolution filter, students will be able to understand the mechanism of deep learning in image diagnosis and to learn the adaptation range and limitations in the first half.

In the second half, students will learn about the overview and problems of the latest systems and models, including Vision-Transformer (ViT) as an image recognition system and Stable Diffusion as an image generation system.

### 【Attainment target】

Students will learn the mechanism and operation of machine learning step by step, and practice multi-layer convolutional neural networks, auto-encoders, and GANs (Generative Adversarial Networks) to understand the applicable range and limitations.

- 1) Students will build a Jupyter environment and run Python and NumPy.
- 2) Students will exercise with “TensorFlow and Keras” and explain basic concepts of machine learning.
- 3) Students will explain the classification algorithm, logistic regression, and maximum likelihood estimation.
- 4) Students will explain softmax, minibatch, stochastic gradient descent, and calculation errors.
- 5) Students will explain neural networks, activation functions, hidden layers, and the differences between single-layer and multilayer.
- 6) Students will explain the classification of images using convolution filters, pooling layers, and feature variables, and dynamic learning of filters.
- 7) Students will explain the heat map through multi-layered convolution filter and exercise of automatic recognition application of handwritten characters.
- 8) Students will explain the basis for judgment of machine learning models and explain various gradient-based highlighting methods.
- 9) Students will explain the black box problem of AI (accountability), the bias problem of AI (fairness), the vulnerability problem of AI, the quality assurance problem of AI, the fake video problem, and the thinking guidance problem by social media.
- 10) Students will explain ResNet and U-Net.

- 11) Students will explain the auto encoder.
- 12) Students will explain the outline and problems of GAN (Generative Adversarial Network).
- 13) Students will explain the difference between machine learning recognition and human recognition in image diagnosis.
- 14) Students will explain the overview and problems of various system models including Vision-Transformer (ViT).

**【Study method・attention】**

**The main text is Japanese. Here are some similar English texts, but none are the same. The content and materials of the assignment study will be presented in English as in Course A.**

Course B requires students to take Course A. Autumn enrollees can take Course A in the second semester of this year and Course B in the first semester of the following year.

If you decide to take this course, please contact me by E-mail to "[nisiyama@dent.niigata-u.ac.jp](mailto:nisiyama@dent.niigata-u.ac.jp)".

This course is online based system. You can download the text and assignments from the following web site.

Site URL for the Diagnostic Imaging Practice: <https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/>

After doing assignments, you should send back the products by E-mail. After submission of products, you can download the answer and explication with the password.

We will use Python or MATLAB as programming language.

For MATLAB, please take the "AI, Machine Learning, and Deep Learning" (24 hours in total) of the "Self-Paced Online Courses" (<https://matlabacademy.mathworks.com/en/>) and obtain a certificate of completion. Can be used in place of # 1-14.

For Python, Jupyter notebook and Neural network console (Sony) will be used for the execution environment. In the first half, you can use the online version if you do not use medical images, but exercises using medical images must be performed on a locally operating system (offline version). If it is difficult to construct a local environment, exercises will be conducted at a designated terminal in the Division of Oral and Maxillofacial Radiology.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance, Exercises using Python, NumPy, Jupyter. About system installation according to the learning environment.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a>	H. Nishiyama
2	10/11	AI & Machine Learning & Deep Learning. Part 1. About 3 steps of machine learning model About error function, steepest descent method, meaning and importance of differentiable function.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a> Specified textbook [1]: Chapter 1-1, 1-2 (p. 15-60)	H. Nishiyama
3	10/18	AI & Machine Learning & Deep Learning. Part 2. About neural networks, deep learning, classification problems, maximum likelihood estimation, logistic regression	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/</a> Specified textbook [1]: Chapter 1-3, 2-1-2 (p. 61-	H. Nishiyama



			89)	
4	10/25	AI & Machine Learning & Deep Learning. Part 3. About learning by least squares method (polynomial approximation, regression curve), and differences between model selection bias and overfitting	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 2-1-3 (p.90-94)	H. Nishiyama
5	11/1	AI & Machine Learning & Deep Learning. Part 4. About softmax, minibatch, and stochastic gradient descent method.	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 2-2 (p.95-118)	H. Nishiyama
6	11/8	AI & Machine Learning & Deep Learning. Part 5. About neural networks, activation functions, hidden layers, and the difference between single-layer and multi-layer, and TensorBoard	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 3 (p.119-156)	H. Nishiyama
7	11/15	About the Machine and Deep Learning System and image diagnosis. Part 1. About convolution filters, pooling layers, image classification by features / features variables, and dynamic filter learning	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 4 (p.157-198)	H. Nishiyama
8	11/22	About the Machine and Deep Learning System and image diagnosis. Part 2. About multi-layered convolution filters, creating automatic handwriting recognition system, and heatmaps	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 5.1-5.3.1 (p.199-234)	H. Nishiyama
9	11/29	About the Machine and Deep Learning System and image diagnosis. Part 3. About autoencoder and anomaly detection	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]: Chapter 5.3.2 (p.199-234)	H. Nishiyama
10	12/6	About the Machine and Deep Learning System and image diagnosis. Part 4. About image generation by DCGAN	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [1]:	H. Nishiyama

			Chapter 5.3.2 (p. 241-252)	
11	12/13	About the Machine and Deep Learning System and image diagnosis. Part 5. About Sony Neural Network Console Exercises with LeNet	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [2]: p.15-47	H. Nishiyama
12	12/20	About the Machine and Deep Learning System and image diagnosis. Part 6. About region division by U-Net using chest X-ray image	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [2]: p.48-56	H. Nishiyama
13	1/10	About the Machine and Deep Learning System and image diagnosis. Part 7. About GAN (Generative Adversarial Network) using chest X-ray images. About Image generation system (including Stable Diffusion)	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a> Specified textbook [2]: p.72-78	H. Nishiyama
14	1/17	About the Machine and Deep Learning System and image diagnosis. Part 8. About autoencoder in Neural network console About super-resolution (PLUSE, StyleGAN2) About ViT (Visual Transformer)	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a>	H. Nishiyama
15	1/24	About the Machine and Deep Learning System and image diagnosis, summary. About the difference between the features captured by artificial intelligence and the features captured by humans in "image recognition" About the Adversarial example About the limits of deep learning About the difference between "diagnosis support" and "diagnosis" by artificial intelligence About using for other than images About OECD, and Japanese Law	Do the exercises of the day <a href="https://www5.dent.niigata-u.ac.jp/~nisiyama/grad/">https://www5.dent.niigata-u.ac.jp/~nisiyama/ grad/</a>	H. Nishiyama
16	1/31	Examination multi-choice objective test	Review of the course	H. Nishiyama
<b>【Evaluation】</b> The evaluation is performed by the multi-choice objective test (60%) and exercise submissions (40%). The exam will be conducted using the "Mini Test" function of the campus web (campus portal) information				

system. Please note that all materials, online or offline, will be allowed to be referenced in order to assess practical skills rather than memorization. However, the act of inquiring or asking questions to others (including ChatGPT) and exchanging information between examinees are prohibited.

**【Media】**

The main text is Japanese. Here are some similar English texts, but none are the same. The content and materials of the assignment study will be presented in English as in Course A.

If you find it difficult to take the course in Japanese, please obtain a certificate of completion from MATLAB online "Self-Paced Courses" "AI, Machine Learning, and Deep Learning". This certificate of completion will be used in place of the 1st to 14th classes. (<https://matlabacademy.mathworks.com/en/>)

**Specified textbook [1]:**TensorFlow と Keras で動かしながら学ぶ ディープラーニングの仕組み ~畳み込みニューラルネットワーク徹底解説~ (マイナビ / 中井悦司) 本体 2,690 円 (税別)

\*There are no English-language books corresponding to the Japanese version, but similar books as follows:  
TensorFlow For Dummies 1st Edition (For Dummies / by Matthew Scarpino) Paperback: about \$34.91 online shop.

Deep Learning with TensorFlow 2 and Keras: Regression, ConvNets, GANs, RNNs, NLP, and more with TensorFlow 2 and the Keras API, 2nd Edition (Packt Publishing / by Antonio Gulli, Amita Kapoor, Sujit Pal) Paperback: about \$41.05 online shop.

**Specified textbook [2]:**医療 AI とディープラーニングシリーズ 標準 医用画像のためのディープラーニング: 入門編 (オーム社 / 福岡 大輔; 著・編集, 藤田 広志; 監修) 本体 2,800 円 (税別)

\*This is a Japanese book specialized for Sony's neural network console system. There is no corresponding English book, but there are English-related materials at the following site.

<https://dl.sony.com/>

<https://support.dl.sony.com/>

**【Reference book】**

1. Main reference books

Deep Learning with Python, Second Edition (Manning Publications / Francois Chollet) Paperback: about \$66.52 online shop.

Jupyter Notebook 101 (Bowker / by Michael Driscoll) Paperback: about \$24.52 online shop.

2. Recommended books and site(URL)

<https://docs.w3cub.com/tensorflow~python/>

Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, Third Edition (O'Reilly Media / by Aurélien Géron) Paperback: about \$78.71 online shop.

AI-first Healthcare: AI Applications in the Business and Clinical Management of Health (O'Reilly Media / by Kerrie L. Holley, Siupo Becker) Paperback: about \$53.00 online shop.

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5465	1	Wed／3・IA	2	9114	Lecture and Practice
230N5467		Wed／6・IIA			
230N5466	2	Wed／3・IB	2	9115	Lecture and Practice
230N5468		Wed／6・IIB			
Course	Head and neck radiation oncology IA, IIA, IB, IIB				
Instructor	Lecturer Katsura Kouji (Div. Oral and dental Radiology, Medical and Dental Hospital )				
Place	Laboratory in Div. Oral and Maxillofacial Radiology				
IA・IIA					
<p>【Course outline】</p> <p>Radiotherapy plays an important role in cancer treatment of the head and neck region including the oral cavity. In addition, a proper understanding of radiotherapy is essential for oral supportive care in head and neck radiotherapy patients. This course provides the basics sciences of head and neck radiotherapy.</p> <p>【Course aim】</p> <p>Learn systematically about head and neck radiotherapy, from the radiation physics and biology to basics of clinical oncology, for necessary to understand radiation therapy.</p> <p>【Attainment target】</p> <p>1) To explain the overview of head and neck radiotherapy.</p> <p>2) To explain the concept of radiotherapy.</p> <p>3) To explain the protection and safety management in radiotherapy.</p> <p>4) To explain the physics for radiotherapy.</p> <p>5) To explain the biology for radiotherapy.</p> <p>【Study method・attention】</p> <p>Formative evaluation: Question-and-answer session after each presentation. This class is a real-time online lesson using zoom.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/12	Guidance	Details are instructed in class		K. Katsura
2-6	4/19 4/26 5/10 5/17 5/24	Practice of head and neck radiotherapy ・Oral cancer ・Pharyngeal cancer ・Other cancers ・Lymphoma ・Palliative radiotherapy	Textbook pp 4～14, pp 26～43, pp 87～92		K. Katsura
7-8	5/31 6/7	Concept of radiotherapy	Textbook pp 119～129.		K. Katsura
9	6/14	Protection and safety management in radiotherapy	Textbook pp 130～139.		K. Katsura

10-12	6/21 6/28 7/5	Physics for radiotherapy • What's a radiotherapy • Radiation treatment planning • Irradiation methods	Textbook pp 142~169.	K. Katsura
13-15	7/12 7/19 7/26	Biology for radiotherapy • Biological theories • Modifications for radiotherapy • Temporal dose distribution for radiotherapy	Textbook pp 177~198.	K. Katsura
16	8/9	Summary and examination	Review the lecture materials for this course.	K. Katsura

#### 【Evaluation】

Summative evaluation (70%): multiple-choice and open-ended tests or presentation. Attitude in the lecture and interest in the field (30%). The Summary and examination will be done using Zoom.

#### 【Media】

Easy understanding text for radiotherapy (Shujunsha) (JPY 3,520 with tax)

#### 【Reference book】

Cancer • radiotherapy 2017 (Shujunsha) (JPY 33,000 with tax)

#### 【Link】

<https://www.jastro.or.jp/medicalpersonnel/guideline/jastro/2020.html>

#### IB • IIB

#### 【Course outline】

Radiotherapy plays an important role in cancer treatment of the head and neck region including the oral cavity. In addition, a proper understanding of radiotherapy is essential for oral supportive care in head and neck radiotherapy patients. This course provides the practices of head and neck radiotherapy and oral supportive care for head and neck radiotherapy patients.

#### 【Course aim】

Learn systematically about head and neck radiotherapy, from the basics of clinical oncology, physics, and biology necessary for understanding of radiation therapy to radiation treatment planning.

#### 【Attainment target】

- 1) To explain the overview of head and neck radiotherapy.
- 2) To explain the protection and safety management in radiotherapy.
- 3) To explain the normal tissue reactions to radiation.
- 4) To explain the radiotherapy for head and neck cancer recommended by the guidelines.
- 5) To explain the adverse events of head and neck radiotherapy and its measures.

#### 【Study method•attention】

Formative evaluation: Pre and posttest. Lecture materials are provided by e-mail. It is preferable to have completed IA or IIA courses. This class is a real-time online lesson using zoom.

#### 【Plan】

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/4	Guidance	Details are	K. Katsura

			instructed in class.	
2	10/11	Overview of head and neck radiotherapy treatment planning	Textbook 1 pp 2-7	K. Katsura
3	10/18	Risk management for head and neck radiotherapy	Textbook 1 pp 22-28	K. Katsura
4	10/25 11/1	Normal tissue reactions • Overviews • Detail practice	Textbook 1 pp 48-59	K. Katsura
5	11/8	Overview of head and neck radiotherapy.	Textbook 1 pp 94-101	K. Katsura
7-12	11/15 11/29 12/6 12/13 12/20 1/10	Head and neck radiotherapy for recommended by the guidelines • Oral cancer( excluding tongue cancer) • Tongue cancer • Maxillary sinus cancer • Nasopharyngeal cancer • Oropharyngeal cancer • Hypopharyngeal cancer • Lymphoma( including head and neck region)	Textbook 1 pp 105-158, pp 306-330	K. Katsura
13-15	1/17 1/24 1/31	Adverse events of head and neck radiotherapy and its measures • Oral mucositis • Trismus and osteoradionecrosis • Salivary dysfunction	Textbook 2 pp 99-122, pp 141-150, pp203-224	K. Katsura
16	2/7	Summary and examination	Review the lecture materials for this course.	K. Katsura

#### 【Evaluation】

Summative evaluation (70%): multiple-choice and open-ended tests or presentation. Attitude in the lecture and interest in the field (30%). The Summary and examination will be done using Zoom.

#### 【Media】

JASTRO guidelines 2020 for radiotherapy treatment planning (Kanehara-shuppan) (JPY 4,950 with tax)

Oral Complications of Cancer and its Management (Nagasueshoten) (JPY 9,350 with tax)

#### 【Reference book】

Cancer • radiotherapy 2017 (Shujunsha) (JPY 33,000 with tax)

#### 【Link】

<https://www.jastro.or.jp/medicalpersonnel/guideline/jastro/2020.html>

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5469	1	Thu／1・IA	2	9114	PRACTICE
230N5471		Thu／5・IIA			
230N5470	2	Thu／1・IB	2	9115	PRACTICE
230N5472		Thu／5・IIB			
Course	Pain Management IA, IIA, IB, IIB				
Instructor	Prof. Kenji Seo (Div. of Dental Anesthesiology) Ext. 2970 e-mail: seo@dent.niigata-u.ac.jp				
Place	Outward patient clinic and conference room of Dental Anesthesia				
IA・IIA					
<p>【Course outline】</p> <p>This course aims to understand the diagnosis and treatment of pain disease.</p> <p>【Course aim】</p> <p>In this course, the students are requested to learn orofacial pain, diagnosis, treatment and examination for multimodal sensation.</p> <p>【Attainment target】</p> <p>After this course, the students are able to</p> <ul style="list-style-type: none"><li>• conduct clinical examination (quantitative sensory testing) in the patients</li><li>• diagnose a pain disease</li><li>• understand orofacial pain feature</li><li>• understand pain treatment</li></ul> <p>【Study method・attention】</p> <p>Contents of the preparations for the next class will be informed in the previous class.</p> <p>The students need to attend on the clinical activity in the outward patient clinics.</p>					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/06	Guidance			Kenji Seo
2	4/13	Disease and its diagnosis	TEXTBOOK		Kenji Seo
3-15	4/20	Case observation and analysis of abnormal findings	Textbook		Kenji Seo
	4/27				
	5/11				
	5/18				
	5/25				
	6/01				
	6/08				
	6/15				
	6/22				
	6/29				
7/06					

	7/13 7/20			
16	7/27	Examination		Kenji Seo
<p><b>【Evaluation】</b> Students need to pass the oral examination. (statement 50%, discussion 50%)</p> <p><b>【Media】</b> Orofacial pain (Sessle, Lavigne, Lund, Dubner) second edition, Quintessence publishing Text book of pain (Wall/Melzack) Churchill Livingstone 口腔顔面痛の診断と治療ガイドブック、医歯薬出版(In Japanese)</p> <p><b>【Reference book】</b> Some manuscripts are provided during the course.</p>				
<p><b>IB・IIB</b></p> <p><b>【Course outline】</b> This course aims to understand the diagnosis and treatment of pain disease.</p> <p><b>【Course aim】</b> In this course, the students are requested to learn orofacial pain, diagnosis, treatment and examination for multimodal sensation.</p> <p><b>【Attainment target】</b> After this course, the students are able to</p> <ul style="list-style-type: none"> <li>• conduct clinical examination (quantitative sensory testing) in the patients</li> <li>• diagnose a pain disease</li> <li>• understand orofacial pain feature</li> <li>• understand pain treatment</li> </ul> <p><b>【Study method・attention】</b> Contents of the preparations for the next class will be informed in the previous class. The students need to attend on the clinical activity in the outward patient clinics.</p>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/05	Guidance		Kenji Seo
2	10/12	Disease and its diagnosis	Textbook	Kenji Seo
3-15	10/19 10/26 11/02 11/09 11/16 11/30 12/07 12/14 12/21 1/11 1/18	Case observation and analysis of abnormal findings	Textbook	Kenji Seo



	1/25 2/01			
16	2/08	Examination		Kenji Seo
<p><b>【Evaluation】</b> Students need to pass the oral examination. (statement 50%, discussion 50%)</p> <p><b>【Media】</b> Orofacial pain (Sessle, Lavigne, Lund, Dubner) second edition, Quintessence publishing Text book of pain (Wall/Melzack) Churchill Livingstone 口腔顔面痛の診断と治療ガイドブック、医歯薬出版(In Japanese)</p> <p><b>【Reference book】</b> Some manuscripts are provided during the course.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5473	1	Fri/3・4・IA	2	9114	Real time online lecture using Zoom (Online examination)
230N5475		Fri/6・7・IIA			
230N5474	2	Fri/3・4・IB	2	9115	Real time online lecture using Zoom (Online examination)
230N5476		Fri/6・7・IIB			
Course	Seminar on Peripheral nerve regeneration IA, IIA, IB, IIB				
Instructor	Assoc Prof. Naotaka Kishimoto, Prof. Kenji Seo				
Place	Online using ZOOM				
IA・IIA					
<b>【Course outline】</b> Seminar on peripheral nerve regeneration is to prepare cell extract from two types of stem cells derived from adipose tissue and to evaluate the effect on neural cells					
<b>【Course aim】</b> Students will learn the basic techniques of cell culture and understand the characteristics of stem cell derived cell extract and its effect on neural cells.					
<b>【Attainment target】</b> Students will explain the basic operation for cell culture. Students will explain how to isolate stem cells. Students will explain how to prepare cell extract.					
<b>【Study method・attention】</b> Preparations for the next class will be informed in the previous class. Students can take either A or B courses.					
<b>【Plan】</b>					
No.	Date	Contents	Out-of-Class Study	Instructor	
1	4/7	Guidance	Preparations will be informed in the previous class.	Kishimoto	
2	4/14	Handling of cell culture instruments	Preparations will be informed in the previous class.	Kishimoto	
3	4/21	Basic techniques for cell culture -part 1-	Preparations will be informed in the previous class.	Kishimoto	
4	4/28	Basic techniques for cell culture -part 2-	Preparations will be informed in the previous class.	Kishimoto	

5	5/12	Isolation of dedifferentiated fat cells	Preparations will be informed in the previous class.	Kishimoto
6	5/19	Preparation of cell extract derived from dedifferentiated fat cells	Preparations will be informed in the previous class.	Kishimoto
7	5/26	Analysis of characteristics of cell extract derived from dedifferentiated fat cells -part 1-	Preparations will be informed in the previous class.	Kishimoto
8	6/2	Analysis of characteristics of cell extract derived from dedifferentiated fat cells -part 2-	Preparations will be informed in the previous class.	Kishimoto
9	6/9	Isolation of adipose-derived stem cells	Preparations will be informed in the previous class.	Kishimoto
10	6/16	Preparation of cell extract derived from adipose-derived stem cells	Preparations will be informed in the previous class.	Kishimoto
11	6/23	Analysis of characteristics of cell extract derived from adipose-derived stem cells -part 1-	Preparations will be informed in the previous class.	Kishimoto
12	6/30	Analysis of characteristics of cell extract derived from adipose-derived stem cells -part 2-	Preparations will be informed in the previous class.	Kishimoto
13	7/7	Analysis of the effect of cell extract on Schwann cells	Preparations will be informed in the previous class.	Kishimoto
14	7/14	Analysis of the effect of cell extract on neurons	Preparations will be informed in the previous class.	Kishimoto
15	7/21	Review of the course and Examination	Preparations will be informed in the previous class.	Kishimoto Seo

**【Evaluation】**

Oral exam 50%, Report 40%, Learning manner 10%

**【Media】**

References will be provided if needed.

**【Reference book】**

Mature adipocyte-derived dedifferentiated fat cells exhibit multilineage potential. J Cell Physiol. 2008;215(1):210-22.

**【Course outline】**

Seminar on peripheral nerve regeneration is to prepare cell extract from two types of stem cells derived from adipose tissue and to evaluate the effect on neural cells

**【Course aim】**

Students will learn the basic techniques of cell culture and understand the characteristics of stem cell derived cell extract and its effect on neural cells.

**【Attainment target】**

Students will explain the basic operation for cell culture.

Students will explain how to isolate stem cells.

Students will explain how to prepare cell extract.

**【Study method・attention】**

Preparations for the next class will be informed in the previous class.

Students can take either A or B courses.

**【Plan】**

No.	Date	Contents	Out-of-Class Study	Instructor
1	10/6	Guidance	Preparations will be informed in the previous class.	Kishimoto
2	10/13	Handling of cell culture instruments	Preparations will be informed in the previous class.	Kishimoto
3	10/20	Basic techniques for cell culture -part 1-	Preparations will be informed in the previous class.	Kishimoto
4	10/27	Basic techniques for cell culture -part 2-	Preparations will be informed in the previous class.	Kishimoto
5	11/10	Isolation of dedifferentiated fat cells	Preparations will be informed in the previous class.	Kishimoto
6	11/17	Preparation of cell extract derived from dedifferentiated fat cells	Preparations will be informed in the previous class.	Kishimoto
7	11/24	Analysis of characteristics of cell extract derived from dedifferentiated fat cells -part 1-	Preparations will be informed in the previous class.	Kishimoto
8	12/1	Analysis of characteristics of cell extract derived from dedifferentiated fat cells -part 2-	Preparations will be informed in the previous class.	Kishimoto

9	12/8	Isolation of adipose-derived stem cells	Preparations will be informed in the previous class.	Kishimoto
10	12/15	Preparation of cell extract derived from adipose-derived stem cells	Preparations will be informed in the previous class.	Kishimoto
11	12/22	Analysis of characteristics of cell extract derived from adipose-derived stem cells -part 1-	Preparations will be informed in the previous class.	Kishimoto
12	1/12	Analysis of characteristics of cell extract derived from adipose-derived stem cells -part 2-	Preparations will be informed in the previous class.	Kishimoto
13	1/19	Analysis of the effect of cell extract on Schwann cells	Preparations will be informed in the previous class.	Kishimoto
14	1/26	Analysis of the effect of cell extract on neurons	Preparations will be informed in the previous class.	Kishimoto
15	2/2	Review of the course and Examination	Preparations will be informed in the previous class.	Kishimoto Seo
<p><b>【Evaluation】</b>  Oral exam 50%, Report 40%, Learning manner 10%</p> <p><b>【Media】</b>  References will be provided if needed.</p> <p><b>【Reference book】</b>  Mature adipocyte-derived dedifferentiated fat cells exhibit multilineage potential. J Cell Physiol. 2008;215(1):210-22.</p>				

Course No.	Semester	Date	Credit	Academic Field and Standard	Type of class
230N5477	1	Tue/3・4・IA	2	9114	Seminar
230N5479		Tue/3・4・IIA			
230N5478	2	Tue/3・4・IB	2	9115	Seminar
230N5480		Tue/3・4・IIB			
Course	Dental psychosomatic medicine IA, IIA, IB, IIB				
Instructor	Lecturer Yutaka Tanaka, Prof. Kenji Seo				
Place	Department of Dental Anesthesiology, Niigata University Medical and Dental Hospital				
IA・IIA					
【Course outline】 Psychosomatic dentistry of orofacial pain (basic course) 【Course aim】 In this course, the students are requested 1. to understand about the psychosomatic state of patients with orofacial pain. 2. to learn of the psychosomatic factors contributing to the orofacial pain. 【Attainment target】 After this course, the students should be able to ・understand the psychosomatic examination and analyze the results ・evaluate psychosomatic factors in the patients with orofacial pain ・speculate relationship between psychosomatic factors and results of the examinations 【Study method・attention】 Preparations for the next class will be informed in the previous class.					
【Plan】					
No.	Date	Contents	Out-of-Class Study		Instructor
1	4/11	Guidance			Yutaka Tanaka
2-15	4/18, 4/25, 5/02, 5/09, 5/16, 5/23, 5/30, 6/06, 6/13, 6/20, 6/27, 7/04, 7/11, 7/18	Case observation	Preparations will be informed in the previous class.		Yutaka Tanaka
16	7/25	Summary and oral examination			Yutaka Tanaka Kenji Seo
【Evaluation】 Attendance attitude (20%)、Reports (30%), and oral examination (50%) 【Media】 References will be provided if needed.					

<b>【Reference book】</b> References will be provided if needed.				
<b>IB・IIB</b>				
<b>【Course outline】</b> Psychosomatic dentistry of orofacial pain (advanced course)				
<b>【Course aim】</b> In this course, the students are requested <ol style="list-style-type: none"> <li>1. to analyze the psychosomatic state of patients with orofacial pain</li> <li>2. to Evaluation of the psychosomatic factor contributing to the orofacial pain</li> </ol>				
<b>【Attainment target】</b> After this course, the students are expected to be able to <ul style="list-style-type: none"> <li>• use the psychosomatic examination and analyze the results</li> <li>• speculate relationship between psychosomatic factors and results of the examinations</li> <li>• evaluate psychosomatic factors in the patients with orofacial pain.</li> <li>• determine the diagnosis of orofacial pain and dental psychosomatic diagnosis.</li> </ul>				
<b>【Study method・attention】</b> <ol style="list-style-type: none"> <li>1. Preparations for the next class will be informed in the previous class.</li> <li>2. It is desirable for students to have taken A course.</li> </ol>				
<b>【Plan】</b>				
No.	Date	Contents	Out-of-Class Study	Instructor
1	10/03	Guidance		Yutaka Tanaka
2-11	10/10, 10/17, 10/24, 10/31, 11/07, 11/14, 11/21, 11/28, 12/05, 12/12,	Psychosomatic analysis and evaluation	Preparations will be informed in the previous class.	Yutaka Tanaka
12-15	12/19, 12/26, 01/16, 01/23	Evaluation of the psychosomatic factor contribution to the orofacial pain	Preparations will be informed in the previous class.	Yutaka Tanaka
16	01/30	Summary and oral examination		Yutaka Tanaka Kenji Seo
<b>【Evaluation】</b> Attendance attitude (20%)、Reports (30%), and oral examination (50%)				
<b>【Media】</b> References will be provided if needed.				
<b>【Reference book】</b> References will be provided if needed.				

