Tokyo Medical and Dental University
and
Chulalongkorn University

International Joint Degree
Doctor of Philosophy Program in
Orthodontics

Course Guidelines

2023

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1. Outline of the program

Tokyo Medical and Dental University (TMDU) and Chulalongkorn University (CU) International Joint Degree Doctor of Philosophy Program in Orthodontics

Human Resource Development Goals

The program is devoted to developing researchers who are well-versed in specialized knowledge that spans the life sciences, especially orthodontics, and who act as global leaders and cooperate closely with their counterparts in other fields; educators who are rich in spirit and have highly developed expertise in devising and implementing effective educational strategies; highly specialized medical professionals who have uncompromising ethical views and passionate interest in research; and opinion leaders who will act as pioneers in a new and more progressive era.

Diploma Policy

The program confers the degree of Doctor of Philosophy on students who attain the required credits and pass the dissertation defense and final examinations. Degree recipients must also fulfill the following requirements.

(1) Ability to acquire technical knowledge in English as a common language, and communicate smoothly in English.

(2) Ability to continue learning in one's specialty field for life.

(3) Ability to understand and speak on current issues in the fields of dentistry, especially orthodontics, not only in Japan and Thailand but also in Southeast Asia; prioritize critical problems; plan research and formulate proposals needed to solve such problems.

(4) Ability to be a leader in research, education and dental treatment, coordinating with the respective people overseas in the fields of medical and dental sciences, especially orthodontics.

Curriculum Policy

The curriculum has been designed based on the following policies in order to create an environment in which students can acquire the knowledge, skills, experience and leadership abilities necessary to obtain a degree and become a highly specialized medical professional.

(1) Establish basic and special subjects related to orthodontics to foster professionals with strong capabilities in research, in-depth specialized knowledge, thinking skills and high standards of ethics, who can contribute to the world through research.

(2) Establish clinical subjects that enable students to acquire expert knowledge and skills in clinical orthodontics.

(3) Organize presentation-style participatory seminars to enable students to acquire fundamental capabilities in orthodontics.

(4) Organize special lectures on special subjects that enable students to define problems in various situations which can be objects of study, scientifically analyze them, create science-based solutions for them, and evaluate the results of solving them.

(5) Establish Practice of Research as a special subject to enable students to plan and carry out research which contributes to the world, and establish Experimentation and Thesis Writing as a subject to aid writing dissertations with the essential content.

(6) Evaluate student academic performance based on formative and summative criteria, as described in the syllabus, in order to achieve educational goals.

Admission Policy

This program aims to foster highly skilled experts as well as global leaders who possess a wealth of knowledge and techniques in the field of dentistry, especially orthodontics, not only in Japan and Thailand but in Southeast Asia. Qualified applicants who meet any of the following criteria are therefore highly encouraged to apply for our program.

(1) Eager to acquire advanced clinical ability, basic knowledge and techniques in the field of orthodontics, or understanding grounded in the latest research in the field of orthodontic sciences and maxillofacial orthognathics.

(2) Eager to be an independent basic-clinical researcher in the fields of orthodontics with the capacity to take the lead in national/international clinical research projects or clinical education upon completion of course.

Standard Number of Years Required for Completion and Conferral of Academic Degree

Five years are normally required to completion. A degree of “Doctor of Philosophy” will be awarded to students who attain the required credits and pass the dissertation defense.

2. Requirements for completion and course registration

Requirements for completion

An academic degree (Doctor of Philosophy in Dental Science) will be jointly conferred by TMDU and CU on students who have satisfied the following conditions in 5 years or more (8 years maximum). One credit is equivalent to 45 hours of study in both universities.

(1) In addition to completing the number of credits required by Japanese law and TMDU, students are required to complete the number of credits mandated by Thai law and CU. The required credits are listed in the attached document annex 1.

(2) To complete the JD program, students should attend 5 or more years (a maximum of 8 years); complete the required number of credits listed in annex 1; receive necessary research guidance; submit a dissertation; and pass a dissertation defense.

(3) Dissertation should be published through submission to an international academic journal with a referee system prior to dissertation defense.

The academic credit systems at TMDU and CU are as follows:

(1) Credit from TMDU shall be based, in principle, on a course requiring 45 hours of study per credit. However, credit can be obtained for 15 hours of lecture, 30 hours of practice, and 45 hours of laboratory activities and practical training.

(2) Credit from CU shall be based, in principle, on a course requiring 45 hours of study per credit. However, credit can be obtained for 15 hours of lecture, 45 hours of practice, and 45 hours of laboratory activities and practical training.

Course requirements

Students must acquire 72 credits from among the following subjects:

(1) Basic subjects－compulsory: 1 credit of General Orthodontics, 2 credits of Essential Orthodontics and 1 credit of Seminar in Basic Orthodontics.

(2) Clinical subjects－compulsory: 3 credits of Orthodontic Techniques, 2 credits of Multidisciplinary Treatment Procedures, 1 credit of Seminar in Advanced Orthodontics, 1 credit of Orthodontic Practical Exercise, 2 credits of Orthodontic Clinical Training I, 1 credit of Orthodontic Clinical Training II, 4 credits of Orthodontic Clinical Training III, 1 credit of Advanced Orthodontic Clinical Training I, 3 credits of Advanced Orthodontic Clinical Training II and 1 credit of Advanced Orthodontic Clinical Training III.

(3) Clinical subjects－elective: At least 1 credit from among the following three subjects; Photography and Computer in Orthodontics (1 credit), Skill in Orthodontic Teaching (1 credit) and Academic Writing {Writing a Research Proposal in Dentistry or Writing a Research Report in Dentistry} (1 credit).

(4) Special subjects: 24 credits of Doctoral Dissertation Seminar, 6 credits of Special Lecture, 8 credits of Research Practice and 10 credits of Experimentation and Thesis Writing in Orthodontic Science or Maxillofacial Orthognathics.

(5) In addition to at least the 72 credits mentioned above (24 credits of subjects established by TMDU, and 48 credits of subjects established by CU), all students must receive necessary research guidance, submit a dissertation and pass a dissertation defense. The dissertation should be published in a refereed international academic journal prior to the dissertation defense.

Other

Noted that Bone Biology (2 credits), which is a basic elective subject, is not included in the number of required credits for completing the program.

Assessment

Academic records at TMDU and CU will be recorded and converted according to the following table.

Grade Conversion

TMDU			CU			Standards for Specific Behavioral Objectives (SBOs)
GP	Grade		GP	Grade		
4.0	A+	Superior	4	A	Excellent	All SBOs were achieved beyond expectation. 当該科目の到達目標を期待された水準を超えて達成した
			3.5	B+	Very Good	
3.5	A	Excellent	3	B	Good	All SBOs were achieved. 当該科目の到達目標を全て達成した
3.0	B	Good	2.5	C+	Fairly Good	Most SBOs were achieved. 当該科目の到達目標を概ね達成した
2.0	C	Fair	2	C	Fair	The minimum SBOs necessary were achieved. 当該科目の到達目標のうち最低限を達成した
1.0	D	Failing	1.5	D+	Poor	The minimum SBOs necessary were not achieved. 当該科目の到達目標を達成していない
			1	D	Very Poor	
0.0	F		0	F	Failing	Unable to evaluate based on insufficient SBOs. 到達目標の達成度を評価できない

TMDU			CU		
GP	Grade		GP	Grade	
—	S	Satisfactory	—	S	Satisfactory
—	U	Unsatisfactory	—	U	Unsatisfactory

(Appendix 1)

The number of required credits for completing the program

	Total	The minimum number of required credits at each university	
		TMDU	CU
The number of required credits	72 credits	24 credits or more	48 credits or more

3. Tokyo Medical and Dental University and Chulalongkorn University International Joint Degree Doctor of Philosophy Program in Orthodontics Subjects

No.	Subject category	Compulsory/ Elective	Subjects in English	Subjects in Japanese	Venue	Number of Credits	Year	Semester	No. of subjects required	No. of credits required
1	Basic subjects	Compulsory	General Orthodontics	歯科矯正学総論	C U	1	1st year	1	3	4
2			Essential Orthodontics	歯科矯正学基礎		2	1st year	1		
3			Seminar in Basic Orthodontics	基礎歯科矯正学セミナー		1	1st year	1		
4		Elective	Bone Biology	骨生物学		2	1st year	1		
5	Clinical subjects	Compulsory	Orthodontic Techniques	歯科矯正学技法	C U	3	1st year	1	10	19
6			Multidisciplinary Treatment Procedures	包括的治療手順		2	1st year	1		
7			Seminar in Advanced Orthodontics	上級歯科矯正学セミナー		1	1st year	1		
8			Orthodontic Practical Exercise	矯正演習		1	1st year	1		
9			Orthodontic Clinical Training I	矯正臨床トレーニング１		2	3rd year	6		
10			Orthodontic Clinical Training II	矯正臨床トレーニング２		1	3rd year	Summer		
11			Orthodontic Clinical Training III	矯正臨床トレーニング３		4	4th year	7,8		
12			Advanced Orthodontic Clinical Training I	上級矯正臨床トレーニング１		1	4th year	Summer		
13			Advanced Orthodontic Clinical Training II	上級矯正臨床トレーニング２		3	5th year	9,10		
14			Advanced Orthodontic Clinical Training III	上級矯正臨床トレーニング３		1	5th year	Summer		
15		Elective	Photography and Computer in Orthodontics	歯科矯正学における写真とコンピューター		1	5th year	9	1	1
16			Skill in Orthodontic Teaching	歯科矯正学教育実習		1	5th year	9		
17			Writing a Research Proposal in Dentistry	歯学研究提案書作成		1	5th year	9		
18			Writing a Research Report in Dentistry	歯学研究報告書作成		1	5th year	9		
19	Special subjects	Compulsory	Doctoral Dissertation Seminar	論文・博士論文セミナー	C U	24	1st, 3rd 4th, 5th year	2,5,6,7 8,9,10	1	24
20		Elective	Orthodontic Science Special Lecture	咬合機能矯正学特論	T M D U	6	2nd year	3	3*	24
21			Orthodontic Science Research Practice	咬合機能矯正学研究実習		8	2nd year	3,4		
22			Orthodontic Science Experimentation and Thesis Writing	咬合機能矯正学実験・論文作成		10	2nd, 3rd 4th, 5th year	4,6,8,10		
23			Maxillofacial Orthognathics Special Lecture	顎顔面矯正学特論		6	2nd year	3		
24			Maxillofacial Orthognathics Research Practice	顎顔面矯正学研究実習		8	2nd year	3,4		
25			Maxillofacial Orthognathics Experimentation and Thesis Writing	顎顔面矯正学実験・論文作成		10	2nd, 3rd 4th, 5th year	4,6,8,10		
									Total	72

Note)
* Choose either "Orthodontic Sciences" or "Maxillofacial Orthodontics".

Code 3206721. GEN ORTHO 1(1-0-3)
General Orthodontics

1. Aim of the course
   The aims of the course are to provide basic knowledge of etiology of malocclusion, orthodontic diagnosis procedures and assessment, treatment objectives and treatment planning of various malocclusions.

2. Attainment target (Learning outcome)
   After completing this course, the participant will be able to
   -explain etiology of etiology of malocclusion,
   -competent to perform a thorough clinical examination, taken orthodontic records,
   -competent to formulate treatment planning from analyses of the orthodontic records

3. Course description and timetable
   The study of general orthodontics. Insight in etiology of malocclusion comprises genetic and environmental factors that influence post-natal development of the dentition and facial growth. Knowledge of unfavorable influence of these factors and their interaction. Competent to diagnostic procedures comprises obtain a relevant patient history, perform a thorough clinical examination, determine habitual occlusion, evaluate functional occlusion, and different jaw relationship of patients, evaluate influence of functional component of soft tissues on dento-facial morphology, take high quality impression of the dentition, make face bow registration, and mount dental casts in an articulator, take good extra-oral and intra-oral photographs. Competent to arrive at a proper diagnostic assessment, define treatment objectives and treatment plan for various types of orthodontic and dento-facial abnormalities including strategy of treatment and retention, therapeutic measures, timing and sequence of the application prognosis and estimated treatment and retention time.

   Timetable

Week	Content
1-2	Etiology of malocclusion
3-4	Orthodontic diagnostic procedures
5-7	Cephalometric analyses
8-11	Model analysis
12-15	Orthodontic diagnostic assessment, Treatment objectives, Treatment planning

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class, written examination, assignment report.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver.
   -Handbook of Orthodontics. Robert E. Moyers
   -Graber's Textbook of Orthodontics: Basic Principles and Practice. 4th Edition
   -Orthodontic Cephalometry. A.E. Athanasiou

Code 3206722 ESSEN ORTHO 2(2-0-6)
Essential Orthodontics

1. Aims of the course
   The course aims to provide basic knowledge of development of the dentition, facial growth and development, biology of tooth movement, orthodontic biomechanics and orthodontic materials.

2. Attainment target (Learning outcome)
   After completing this course, the participant will be able to
   -explain development of dentition, facial growth, and biology of tooth movement
   -competent to select, handle and apply orthodontic materials
   -insight in property and composition of orthodontic materials
   -competent to solve problems of tooth movement related to force resultants and force equivalents, estimate force produced by different orthodontic/orthopedic appliances

3. Course description and timetable
   The study of essential orthodontics. Knowledge of development of the dentition comprises the development of normal occlusion and its variations from birth to adulthood. Competent to recognize and identify a given situation of the dentition in terms of normality and abnormality; developmental stage attained; future development and possibility for interceptive measures to improve the final situation. Knowledge of facial growth comprises growth sites in the craniofacial skeleton; post-natal growth changes in craniofacial region and soft tissues; variation in the function of the components in relation to facial growth; individual variation in facial configuration and influence of environmental factors on facial growth. Knowledge of aspects of tooth movements comprises effect of different types of force application on cells and tissues, influence of force system and magnitude and post treatment changes. Knowledge of orthodontic materials comprises parameters for selection of correct material for orthodontic procedures, proper handling and application of orthodontic materials. Insight in property and composition of orthodontic materials. Competent to orthodontic biomechanics comprises understand basic principles of statics and mechanics of materials; solve problems related to force resultants and force equivalents, estimate force produced by different orthodontic/orthopedic appliances.

   Timetable

Week	Content
1-2	Development of dentition
3-5	Facial growth
6-8	Biology of tooth movement
9-13	Orthodontic biomechanics
14-15	Orthodontic materials

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class, written examination, assignment report and exercise.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver.
   -Essential of Facial Growth. 2nd Edition Mark G, Hans Donald H Enlow.
   -Biological Mechanisms of Tooth Movement. Vinod Krishnan, Ze'ev Davidovitch
   -Biomechanics in Orthodontics: Principles and Practice. Ram S.Nanda

-Orthodontic Materials: Scientific and Clinical Aspects. William A. Brantley, Theodore Eliades

Code 3206751 SEM BASIC ORTHO 1(1-0-3)
Seminar in Basic Orthodontics

1. Aims of the course
   The aims of the course are to
   -review basic knowledge in orthodontics from previous studies
   -promote self-learning of the participant by utilization of high technology
   -develop the leadership and self-confidence of the participant

2. Attainment targets (Learning outcomes)
   After completing this course, the participant will
   -realize the evidence base in craniofacial growth, etiology of malocclusion, diagnosis, treatment mechanics and their results,
   -competent to interpret the orthodontic literatures and related fields,
   -improve in his/her leadership and self-confidence.

3. Course description and timetable
   Seminar in basic orthodontics comprises craniofacial growth, etiology of malocclusion, orthodontic diagnosis and treatment planning, treatment mechanics, treatment result and its relapse. The student can realize gap of knowledge that can be solved by research means. Basic knowledge of orthodontic appliances; fixed orthodontic appliances, removable orthodontic appliances, and clear aligners.

   Timetable

Week	Content
1-2	Craniofacial growth and development
3-4	Etiology of malocclusion
5-6	Orthodontic diagnosis
7-13	Orthodontic treatment mechanics and evidence base result
14-15	Relapse of treatment

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular participation in the seminar; benefit of the selected topic, presentation, discussion and report document as a leader of the seminar; and involvement activities as an audience.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver.
   -Handbook of Orthodontics. Robert E. Moyers
   -Graber's Textbook of Orthodontics: Basic Principles and Practice. 4th Edition
   -Essential of Facial Growth. 2nd Edition Mark G., Hans Donald H. Enlow.
   -Biomechanics in Orthodontics:Principles and Practice. Ram S.Nanda
   -Retention and Stability in Orthodontics. Ravindra Nanda

Code 3206894 DOC DISS SEM 0(0-0-0)
Doctoral Dissertation Seminar

1. Aims of the course
   The aims of the course are to
   -encourage the participant to scrutinize problems in orthodontics or related fields that still require profound investigations,
   -promote self-learning of the participant by utilization of high technology

2. Attainment targets (Learning outcomes)
   After completing this course, the participant will
   -realize evidence base in orthodontics and related fields,
   -realize the problem in orthodontics or related fields that can be solved by the profound research
   -present the interesting problem that can be solved by the profound research

3. Course description and timetable
   Presentation and discussion on articles related to the doctoral dissertation to realize research problems, conclusions of the previous studies on materials and methods, results of the studies that still require further investigations so that new knowledge beneficial for orthodontic field can be obtained.

   Timetable

Week	Content
1-3	Biology of tooth movement
4-7	Orthodontic material
8-11	Multidisciplinary treatment
12-15	Evidence base in orthodontics

4. Assessment
   Success of the participant is evaluated from regular participate in the seminar, presentation, and discussion, report and research proposal.

5. Prerequisite reading
   -Biological Mechanisms of Tooth Movement. Vinod Krishnan, Ze'ev Davidovitch
   -Orthodontic Materials: Scientific and Clinical Aspects. William A. Brantley, Theodore Eliades
   -Temporary Anchorage Devices in Orthodontics. Ravindra Nanda
   -Evidence Based Clinical Orthodontics. Peter G Miles, Daniel J Rinchuse, Donald J Rinchuse

Code 3206723 ORTHO TECH 3(3-0-9)
Orthodontic Techniques

1. Aims of the course
   The course aims to provide basic knowledge of
   -orthodontic appliances for active tooth movement and retention period
   -fixed appliance techniques

2. Attainment target (Learning outcome)
   After completing this course, the participant will be able to
   -explain indication, design and limitation of removable appliances, functional appliances, and extraoral appliances
   -insight in indication and application of fixed appliances, treatment concepts and biomechanics of specific orthodontic techniques

3. Course description and timetable
   Knowledge of indication, design, use and limitation of removable appliances, functional appliances, various types of extraoral appliances and combined extra-oral/functional appliances. Competent to construct and repair removable and functional appliances. Insight in indication and application of fixed appliances, different concepts and treatment approaches in design and biomechanical principles of fixed appliance techniques (Edgewise technique, Bioprogressive technique, Straight wire technique, Begg technique, Segmented arch technique) potential and limitation of each technique. Knowledge of indication and contra-indication, design, use and limitation of retention appliances as well as the most appropriate duration of retention. Treatment with alternative appliances such as self-ligating brackets and clear aligners.

   Timetable

Week	Content
1	Removable appliances
2-3	Functional appliances
4-5	Extraoral appliances
6-14	Fixed appliance techniques
15	Retention appliances

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class, written examination, assignment report.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver
   -Practical guide to Orthodontic Appliances. Brian D.Willison, Stephen P Warunek
   -The Role of Removable Appliances in Contemporary Orthodontics. S.J .Littlewood.
   -Twin Block Functional Therapy. 2nd Edition William J Clark
   -BIoprogressive therapy Ricketts RM., Bench RW, Gugino CF, Hilger JJ, Schulhof RJ.
   -Begg Orthodontic Theory and Technique. Begg PR, Kesling PC
   -Modern Edgewise Mechanics & Segmented Arch Technique. Charles J Burstone.
   -Retention and Stability in Orthodontics. Ravindra Nanda

Code 3206724 MULTI TREAT PROCE 2(2-0-6)
Multidisciplinary Treatment Procedures

1 Aims of the course
The aims of the course are to provide basic knowledge of
-multidisciplinary approaches in the treatment of patients with clefts,
-specific aspects of orthodontic treatment with surgery, periodontal disease treatment, restorative treatment, adult patients and craniomandibular dysfunction

2 Attainment targets (Learning outcome)
After completing this course, the participant will be able to
-explain and insight in indication, timing, application of multidisciplinary treatments of cleft patients, specific aspect of orthodontic treatment in cleft patients
-explain indication and application of combined orthodontic-surgical treatment
-explain indication/contraindication of orthodontic treatment in patients with periodontal disease, contributions of orthodontic treatment in these patients
-explain indication and application of combined orthodontic-restorative treatment
-explain indication and specific aspects of orthodontic treatment of adults
-explain etiology of craniomandibular dysfunction, indication/contraindication of orthodontic treatment in patients with craniomandibular dysfunction

3. Course description and timetable
The study of multidisciplinary treatment procedures. Insight in multidisciplinary approaches in the treatment of cleft lip and palate patients comprises indication, timing, and application of multidisciplinary treatment of cleft patients and specific of orthodontic treatment in cleft patients. Knowledge of orthodontic-surgical treatment comprises indication and application of combined orthodontic-surgical treatment, specific aspects of orthodontic treatment in patients requiring orthognathic surgery. Knowledge of orthodontic-periodontal treatment comprises indication and contra-indication of orthodontic treatment in periodontal patients, specific aspects of orthodontic treatment in periodontally compromised dentition and contribution of orthodontic treatment to periodontal patients. Knowledge of orthodontic-restorative treatment comprises indication and application of combined orthodontic-restorative treatment, specific aspects of orthodontic treatment in combined orthodontic-restorative patient care. Knowledge of adult orthodontics comprises indication and specific aspects of orthodontic treatment of adults in collaboration with general practitioners. Knowledge with craniomandibular dysfunction comprises etiology, various treatment procedures, indication and contra-indication for orthodontic treatment in these patients.

Timetable

Week	Content
1-3	Cleft lip and palate treatment
4-10	Orthodontic-surgical treatment
11-12	Orthodontic-periodontal treatment
13	Orthodontic-restorative treatment
14	Adult orthodontics
15	Craniomandibular dysfunction

4. Assessment
Success of the participant is evaluated with a grading system that is not lower than grade B from: regular attend the class, written examination, and assignment report.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver.
   -Current Controversies in Orthodontics. Birte Melsen
   -Contemporary Treatment of Dentofacial Deformity. William R. Proffit

Code 3206752 SEM ADV ORTHO 1(1-0-3)

Seminar in Advanced Orthodontics

1. Aims of the course

   The aims of the course are to

   -review advanced knowledge in orthodontics from previous studies

   -promote self-learning of the participant by utilization of high technology

   -develop the leadership and self-confidence of the participant

2. Attainment targets (Learning outcomes)

   After completing this course, the participant will

   -realize the evidence base in tissue response to treatment mechanics, three-dimensional analysis in orthodontics and orthodontic innovations

   -realize orthodontic problems and related fields that can be solved by the profound investigation

3. Course description and timetable

   Seminar in advanced orthodontics comprises the effect of treatment mechanics on tissue responses, three-dimensional orthodontic analysis, orthodontic innovations for the best effective treatment. Treatment planning, techniques, and mechanics of different types of orthodontic appliances; fixed orthodontic appliances, removable orthodontic appliances, and clear aligners. The student can discuss orthodontic problems and related fields so that these problems can be solved by the deeply investigation.

   Timetable

Week	Content
1-3	Tissue responses to orthodontic treatment mechanics
4-7	Acceleration of orthodontic tooth movement
8-11	Three-dimensional orthodontic
analysis 12-15	Orthodontic innovation

4. Assessment

   Success of the participant is evaluated with a grading system, not lower than grade B from regular participation in the seminar; benefit of the selected topic, presentation, discussion, and report as a leader of the seminar; and involvement activities as an audience.

5. Prerequisite reading

   -Biological Mechanisms of Tooth Movement. Vinod Krishnan, Ze'ev Davidovitch

   -Problem Solving in Orthodontics: Goal-Oriented Treatment Strategies. Chales J. Burstone, Michael R. Marcotte

   -Cone Beam Computed Tomography in Orthodontics: Indications, Insights and Innovations. Sunil Kapila

   -Temporary Anchorage Devices in Orthodontics. Ravindra Nanda

Code 3206741 ORTHO PRAC EXER 1(0-3-1)
Orthodontic Practical Exercise

1. Aims of the course
   The aims of the course are to provide skill in
   -construction of removable and functional appliances, wire bending, and treatment of different types of malocclusions on typodont.
   -evaluate the treatment effect of specific mechanics as related to each technique.

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -design and construct removable and functional appliances
   -apply fixed appliances for correction of various malocclusions
   -evaluate the treatment effect of specific mechanics and its side effect

3. Course description and timetable
   Practical exercises for competent to construct of removable and functional appliances; wire bending and treatment on typodont for different types of malocclusions with various fixed appliance techniques and competent to evaluate the treatment effect of specific mechanics as related to each technique.

   Timetable

Week	Content
1-2	Removable appliances
3-5	Functional appliances
6-15	Typodont practical exercises with fixed appliances

4. Assessment
   Success of the participant is evaluated with a grading system not lower than grade B from regular class attendance, construction of removable appliances, wire bending, management of tooth movement on typodont, problem solving and discussion.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver
   -Practical guide to Orthodontic Appliances. Brian D.Willison, Stephen P Warunek
   -Twin Block Functional Therapy. 2nd Edition William J Clark
   -Bioprogressive Therapy. Ricketts RM., Bench RW, Gugino CF, Hilger JJ, Schulhof RJ.
   -Begg Orthodontic Theory and Technique. Begg PR, Kesling PC.

Code 3206941 ORT CLI TR I 2(0-6-2)

Orthodontic Clinical Training I

1. Aims of the course
   The aim of the course is to provide skill in orthodontic treatment in new patients comprising clinical examination, taking orthodontic records and assessment, formulating treatment planning and management

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -collect patient history,
   -perform clinical examination,
   -take orthodontic records,
   -formulate treatment objectives and planning
   -perform effective treatment

3. Course description and timetable
   Clinical training for competent to obtain a relevant patient history and compliant, perform clinical examination, take high quality of orthodontic records, arrive at a proper diagnostic assessment on the basis of data, define treatment objectives with alternative consideration, define treatment plan and perform effective treatment. Each postgraduate student must start at least 30 well-documented patients with various types of malocclusions.

   Timetable

Week	Content
1-15	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from: regular attend the clinic, case presentation, clinical practice, treatment result.

5. Prerequisite reading
   Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver.

Code 3206942 ORT CLI TR II 1(0-3-1)

Orthodontic Clinical Training II

1. Aims of the course
   The aim of the course is to provide skill in management of continuing orthodontic patients.

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -monitor tooth movement with specific mechanics
   -evaluate treatment progress
   -detect and manage unfavorable effects of treatment

3. Course description and timetable
   Clinical training for competent to monitor tooth movement during treatment with specific biomechanics, evaluate treatment progress and detect the unfavorable side effect.

   Timetable

Week	Content
1-6	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the clinic, clinical practice, treatment result, and report.

5. Prerequisite reading
   Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver

Code 3206943 ORT CLI TR III 4(0-12-4)

Orthodontic Clinical Training III

1. Aims of the course
   The aim of the course is to provide skill in management of active patients transferred for further treatment.

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -provide orthodontic treatment for patients referred from other clinics
   -evaluate treatment alteration from orthodontic records

3. Course description and timetable
   Clinical training for competent to monitor tooth movement with specific biomechanics, manage transferred cases with active treatment and detect treatment changes by analysis of tracings obtained at the critical stages of treatment. Clinical orthodontic practice on patients with craniofacial deficiencies, patients with cleft lips and/or cleft palate. Orthodontic treatments with different types of orthodontic appliances; fixed orthodontic appliances, removable orthodontic appliances, and clear aligners.

   Timetable

Week	Content
1-30	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the clinic, clinical practice, treatment result, and records

5. Prerequisite reading
   Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver

Code 3206944 ADV ORT CLI TR I 1(0-3-1)

Advanced Orthodontic Clinical Training I

1. Aims of the course
   The aims of the course are to provide skill in
   -management of patients who require multidisciplinary approaches
   -utilization of new technology and modern appliances in treatment of complicated malocclusions

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -provide orthodontic treatment as required for multidisciplinary approaches
   -utilize modern appliances as adjunctive treatment

3. Course description and timetable
   Clinical training for competent to manage orthodontic patients who require multidisciplinary approach and alternative treatment with new technology and modern appliances. Clinical orthodontic practice on patients with craniofacial deficiencies, patients with cleft lips and/or cleft palate. Treatment with alternative appliances such as self-ligating brackets and clear aligners.

   Timetable

Week	Content
1-6	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from: regular attend the clinic, clinical practice, treatment result, and report.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver
   -Bioprogressive therapy. Ricketts RM, Bench RW, Gugino CF, Hilger JJ, Schulho RJ.
   -Modern Edgewise Mechanics & Segmented Arch Technique. Charles J Burstone
   -Temporary Anchorage Devices in Orthodontics. Ravindra Nanda

Code 3206945 ADV ORT CLI TR II 3(0-9-3)

Advanced Orthodontic Clinical Training II

1. Aims of the course
   The aims of the course are to provide skill in
   -provide orthodontic aspect in multidisciplinary team
   -provide orthodontic counselling

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -provide orthodontic treatment as required for multidisciplinary approaches
   -determine feasibility of orthodontic treatment alone or consultation for other treatments

3. Course description and timetable
   Clinical training for competent to provide advice after clinical examination concerning feasibility of treatment, more analysis needed for treatment planning or consultation of other specialists for further evaluation and treatment. Additionally competent to provide effective multidisciplinary treatment with favorable result. Clinical orthodontic practice in a multidisciplinary treatment approach to complex cases such as patients with craniofacial deficiencies, cleft lips/cleft palate, and obstructive sleep apnea (OSA). Treatment with alternative appliances such as self-ligating brackets and clear aligners.

   Timetable

Week	Content
1- 30	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from: regular attend the clinic, clinical practice, treatment result, and record.

5. Prerequisite reading
   -Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver

Code 3206949 ADV ORT CLI TR III 1(0-3-1)
Advanced Orthodontic Clinical Training III

1. Aims of the course
   The aims of the course are to provide skill in
   -finishing the orthodontic cases
   -evaluation the treatment effect and presentation of the complete cases
   -preparation of document required for referred cases

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   -undertake orthodontic treatment to the final stage
   -evaluate treatment effects on different malocclusions
   -prepare well document records for referred cases
   -perform case presentations and discussion

3. Course description and timetable
   Clinical training for competent to provide final stage of treatment for complete case or referred case, preparation well-document records and evaluation for both complete cases as well as referred cases. Clinical orthodontic practice in a multidisciplinary treatment approach to complex cases such as patients with craniofacial deficiencies, cleft lips/cleft palate, and obstructive sleep apnea (OSA). Treatment with alternative appliances such as self-ligating brackets and clear aligners.

   Timetable

Week	Content
1- 6	Clinical training

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the clinic, clinical practice, eight complete cases, and three cases for oral presentation.

5. Prerequisite reading
   Contemporary Orthodontics. 5th Edition William Proffits, Henry Fields, David Sarver

Code 3206779 PHOTO COMP ORTHO 1(1-0-3)

Photography and Computer in Orthodontics

1. Aims of the course
   The aim of the course is to provide skill in taking excellent dental photography and utilization of microcomputer in clinical management, cephalometric analysis, and statistical analysis for research.

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be competent to
   - take high quality photographs for orthodontic record
   - utilize a microcomputer and basic software for clinical management, orthodontic analysis, and statistical analysis

3. Course description and timetable

   Dental photography including selection of a camera, lens and film, a digital camera suitable for taking dental photographs; excellent photographic results in daily dental practice, further studies, and research. Use of microcomputer under operating system; program application for spreadsheets in clinical management; inventory system; medical records; word processing; statistical analysis for research; computerized cephalometric analysis for orthodontic treatment.

   Timetable

Week	Content
1-3	Lecture on dental photography
4-6	Lecture on microcomputer and its usage
7-15	Practice

4. Assessment

   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class, course work and assignment report

Code 3206965 SKILL ORTHO TCHG 1(0-3-1)
Skill in Orthodontic Teaching

1. Aims of the course
   The aim of the course is
   -to provide skill in teaching, communication, and problem solving
   -to improve self-confidence, leadership

2. Attainment targets (Learning outcome)
   After completing this course, the participant will be able to pass on clinical and laboratory orthodontic knowledge to undergraduate dental students.

3. Course description and timetable
   Practice in teaching undergraduate dental students for experience in teaching and promotion of communication skill. The postgraduate student can pass on clinical and laboratory orthodontic knowledge effectively.

   Timetable

Week	Content
1-7	Clinical teaching
8-15	Laboratory teaching

4. Assessment
   Skill in teaching and communication is evaluated from: regular teaching in the class, evaluation from teaching staff and undergraduate students with a grading system that is not lower than grade B.

Code 3200761. WRIT RES PROP DENT 1(1-0-3)
Writing a Research Proposal in Dentistry

1. Aim of the course
   The aims of the course are to provide basic knowledge and to practice writing a research proposal in english.

2. Attainment target (Learning outcome)
   After completing this course, the participant will be able to write a research proposal in english to fulfil the program requirements.

3. Course description and timetable
   Writing the background and significance, research question, objectives, and hypotheses of the dental research project, to demonstrate research design and methodology as well as the expected outcome, research funds and total time to finish the proposal.

   Timetable

Week	Content
1-2	Introduction to scientific writing, title, materials and methods
3-4	Literature Review and Conceptual Framework Research Question and Hypothesis
5-7	Materials and Methods
8-11	Summary or Abstract, title and title page, more writing tips
12-15	One-to- one meetings: finalization of the proposal

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class and assignment report.

5. Prerequisite reading
   None

Code 3200762. WRIT RES REPT DENT 1(1-0-3)
Writing a Research Report in Dentistry

1. Aim of the course
   The aims of the course are to provide basic knowledge of writing a research report in english and to practice revising reports based on reviewer comments.

2. Attainment target (Learning outcome)
   After completing this course, the participant will be able to write a complete research report in english and to submit for publication.

3. Course description and timetable
   Writing a research report, including an abstract; introduction; objectives and hypotheses; methodology; results; describing tables; describing figures or graphs; references; revising reports based on reviewer comments.

   Timetable

Week	Content
1-2	Introduction to scientific writing, title, materials and methods
3-4	Figures legend and results, introduction
5-7	Discussion
8-11	Abstract
12-15	Revisions, Responses to Reviewers

4. Assessment
   Success of the participant is evaluated with a grading system, not lower than grade B from regular attend the class and assignment report.

5. Prerequisite reading
   None

Chulalongkorn University
Course Syllabus

1. **Course ID** 3200749
2. **Abbreviation** Bone Biology
3. **Course title** Bone Biology
4. **Course credit** 2(2-0-6)
5. **Department**
   - 5.1 Faculty: Faculty of Dentistry
   - 5.2 Department: not specified/equivalent
   - 5.3 Field:
6. **Measuring method** Letter grade (A B+ B C+ C D+ D F)
7. **Status** Semester Course
8. **Semester** First semester
9. **Academic year** 2559 BE

10. Teaching arrangement

Section	Instructor	Evaluation period
	10002451 Assoc. Prof. Dr. Thanabhumi Osathanont	10.11.2559 – 23.12.2559
	10002456 Dr. Wannakorn Sriarj	10.11.2559 – 23.12.2559
	10003360 Assoc. Prof. Dr. Rajchani Ampornaramvet	10.11.2559 – 23.12.2559
	10015077 Prof. Dr. Prasit Pawasunt	10.11.2559 – 23.12.2559
	10016162 Assist. Prof. Dr. Damrong Damrongsri	10.11.2559 – 23.12.2559
	10019575 Dr. Nuttha Grinkhamhom	10.11.2559 – 23.12.2559

11. Condition

12. Programs

25590011100805: Ph.D. in Orthodontics (International program) (rev.2016)
25500011109783: Ph.D. in Prosthodontics (rev.2015)
25500011109761: M.S. in Prosthodontics (rev.2015)

13. **Level** Master degree
14. **Venues** Pre-clinic building, room 705

15. Course description

Fundamental elements of bone structure with special emphasis on both cellular and molecular biology relevant to bone formation, bone resorption and their mechanisms of regulation.

16. Course outline

16.1 Behavioral objectives

#	Behavioral objectives
1	Understand basic structure and main components of bone, including types of bone main cell Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation
2	Understand growth and development of bone Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation
3	Be able to explain the developmental process of each main cell of bone, as well as the development mechanism Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation
4	Understand mechanism of bone formation and bone resorption, causing by hormone and other substances, in both cell level and molecular level. Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation
5	Be able to explain the pathogenesis of bone diseases, those are concerned in field of dentistry. Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation
6	Understand basic of research process in the study of bone. Learning outcome: 1.1 possessing well-rounded knowledge 1.2 possessing in-depth knowledge Teaching methodology: Narrative Assessment: Report/Project assessment ・Oral presentation

16.2 Weekly contents

Week	Contents	Delegation of work
1	Structure and development of the skeleton, Embryonic development of bone and the molecular regulation of intramembranous and endochondral bone formation Behavioral objective: ・1・2・3 Learning outcome:・1.1・1.2 Instructor: ・Prasit	
2	Bone matrix I: collagen and noncollagenous proteins Behavioral objective: ・1・2 Learning outcome: ・1.1・1.2 Instructor: ・Damrong	
3	Bone matrix II: intercellular junctions and cell-cell communication in bone Behavioral objective: ・1・2 Learning outcome: ・1.1・1.2 Instructor: ・Damrong	
4	Mesenchymal stem cells and osteoblast lineage Behavioral objective: ・4 Learning outcome: ・1.1・1.2 Instructor: ・Nuttha	
5	Transcriptional control of osteoblast differentiation Behavioral objective: ・3 Learning outcome: ・1.1・1.2 Instructor: ・Rajchani	
6	Different bone cells Instructor: Professor Vincent Everts Behavioral objective: ・1 Learning outcome: ・1.1・1.2	
7	Osteoclast I Instructor: Professor Vincent Everts Behavioral objective: ・4 Learning outcome: ・1.1・1.2	
8	Osteocyte and biomechanics of bone Behavioral objective: ・4 Learning outcome: ・1.1・1.2 Instructor: ・Prasit	
9	Bone remodeling and mineral homeostasis Behavioral objective: ・4・5 Learning outcome: ・1.1・1.2 Instructor: ・Nuttha	
10	Osteoclast II instructor: Professor Vincent Everts	

	Behavioral objective: ・4 Learning outcome: ・1.1・1.2	
11	Bone tissue engineering Behavioral objective: ・4・5 Learning outcome: ・1.1・1.2 Instructor: ・Thanabhumi	
12	Bone- implant interaction Behavioral objective: ・4・5 Learning outcome: ・1.1・1.2 Instructor: ・Thanabhumi	
13	Osterimmunology Behavioral objective: ・4・5 Learning outcome: ・1.1・1.2 Instructor: ・Wannakorn	
14	Methods in osteoclasts biology research Behavioral objective: ・6 Learning outcome: ・1.1・1.2 Instructor: ・Damrong	
15	Bone histomorphometry Behavioral objective: ・ 6 Learning outcome: ・1.1・1.2 Instructor: ・Rajchani	
16	Methods in osteoclasts biology research Behavioral objective: ・6 Learning outcome: ・1.1・1.2 Instructor: ・Wannakorn	
17	Final examination/ Student presentation Behavioral objective: ・1・2・3・4・5・6 Learning outcome: ・1.1・1.2 Instructor: ・Thanabhumi・Wannakorn・Rajchani・Prasit・Damrong・Nuttha	

16.3 Teaching media

✔Powerpoint media

16.4 Communications with student through network system

16.41 Form and method: ✔ Email

16.42 Learning Management System (LMS)

16.5 Consultation time 2.0 hour per week

16.6 Assessment

Activities	Percent
	0.00

Grading criteria

research outcome presentation and report

17. Readings materials

17.1 Essential texts:

17.2 Supplementary texts:

1. Principles of Bone Biology, 2nd edition, John Bilezikian, Lawrence Raisz, Gideon Rodan, Elsevier

17.3 Research articles/ Academic articles (if available) :

17.4 Electronic media or related websites :

18. Teaching evaluation

18.1 Teaching evaluation via CUCAS-SCE system

18.2 Course revision based on previous teaching evaluation outcomes

19. Annotation

Orthodontic Science Special Lecture

Lecture (Code: 1001, 2nd year (1st semester): 6 units)

1. Instructors

Professor: Takashi Ono, Eriko Marukawa
Associate Professor: Yasuyuki Michi
Lecturers: Yoshiro Matsumoto, Jun Hosomichi
Assistant Professors: Ippei Watari, Ikuo Yonemitsu, Yuji Ishida, Risa Usumi
Project Assistant Professor: Chiho Kato

2. Classroom/Lab

Check with your supervisor in advance.

3. Course Purpose and Outline

(Purpose)
The purpose of the Orthodontic Science Special Lecture is to understand the current state of clinical orthodontics, which nurtures or improves and further maintains the ability of the occlusal system—comprising teeth, periodontium, jawbones, temporomandibular joints and their associated structures—to be preserved in a healthy state and to maintain physiological function, from infancy through to old age. Through diagnosis derived from problem lists from cases that are all initial clinical orthodontic examinations, and observation in the workplace of drawing up treatment goals and plans, the class subject teaches those current clinical limits, problems to be resolved, and new technologies needing to be developed, that are necessary to identify a research topic.

(Outline)
As is appropriate to the above purpose, teaching will be separated into the following categories using the special lecture format.

1. Methods to extract a list of problems with skeletal structure, alveoli, teeth, disparity, function, temporomandibular joints, soft tissue, or habits that are necessary for diagnosis, from medical examination, tests and data analysis of clinical orthodontic cases.
2. Methods for orthodontic diagnosis from lists of clinical orthodontic case problems.
3. Methods to set treatment goals from lists of clinical orthodontic case problems and diagnoses.
4. Methods to draw up treatment plans from lists of clinical orthodontic case problems, diagnoses and treatment goals.

4. Course Objective(s)

To acquire appropriate and adequate scholarship and the ability to think about clinical orthodontic science, and to master the ability and knowledge to theoretically devise research topics in fundamental medicine relevant to clinical categories.

5. Forma

Class sizes will be small.

6. Course Description

To consider research themes and acquire the necessary clinical knowledge and ability to think, through special lectures in orthodontic science and orthodontics.

To absorb leading edge knowledge from lectures and to absorb the ability to think theoretically as a basis for

debate from presentations and questions at seminars.

7. Grading System

Assessment will be based on evaluation of engagement in discussion and debate and content of presentations and remarks.

8. Prerequisite Reading

Prior to lectures, exercises, and research internships, contact the instructor, confirm the course content, and acquire the necessary knowledge in advance through the following reference materials, etc.

9. Reference Materials

Contemporary Orthodontics 6th edition, Proffit WR, Elsevier Mosby, 2019, ISBN: 9780323543873

Instructions will be given from time to time in relation to a wide variety of references and papers relating to orthodontic science research and clinical orthodontics.

10. Important Course Requirements

Provide advance notice if to be unavoidably absent.

11. Availability in English

Yes.

12. Office Hours

Contact person: Takashi Ono
Field of Orthodontic Science
Mon. - Fri., 16:00–17:00
E-mail t.ono.orts@tmd.ac.jp

13. Note(s) to Students

None.

Orthodontic Science Research Practice

Practice (Code: 1002, 2nd year (full year): 8 units)

1. Instructors

Professor: Takashi Ono, Eriko Marukawa
Lecturers: Yoshiro Matsumoto, Jun Hosomichi
Assistant Professors: Ippei Watari, Ikuo Yonemitsu, Yuji Ishida, Risa Usumi
Project Assistant Professor: Chiho Kato

2. Classroom/Lab

Check with your supervisor in advance.

3. Course Purpose and Outline

(Purpose)
The purpose of Orthodontic Science Research Practice is practical learning of the fundamental medical knowledge necessary to solve problems and achieve progress and development in clinical orthodontics that nurtures or improves and further maintains the ability of the occlusal system—comprising teeth, periodontium, jawbones and their associated structures—to be preserved in a healthy state and to maintain physiological function, from infancy through to old age. The class subject teaches methods to learn methods of fundamental research in orthodontic science. Further, given it is in the clinical field, the research practice has the objective of nurturing highly developed orthodontists who have the fundamentals of orthodontic science and orthodontics and clinical knowledge and techniques.

(Outline)
As is appropriate to the above purpose, teaching will be separated into the following categories using the research practice format, and will be taught comprehensively to educational groups in each academic year.

1. Explanation of the morphology of hard and soft tissue of teeth, periodontium, occlusion, temporomandibular joints and maxillofacial cranium, of stomatognathic function, including chewing, swallowing, pronunciation and breathing, and of brain function, including memory, learning, cognition and behaviour, and achieve deeper understanding of the scientific grounds for nurturing and improving occlusion.
2. Explanation of the responsiveness and adaptation of the occlusal system to external forces such as occlusal and orthodontic forces and explanation of the changes associated with ageing, to increase interest in biological phenomena.
3. Biomechanical and biocompatible materials based explanation of techniques for controlling occlusal shape and function, which is primarily orthodontic treatment, to improve awareness of development of techniques.
4. Explanation of the degree of control of occlusal function that dentists consider necessary and the degree demanded by the layperson, to increase awareness of social dentistry and research ethics.

4. Course Objective(s)

(1) To acquire appropriate and adequate scholarship and ability to think about fundamental medical practice in orthodontic science, and master the ability and knowledge to put research in fundamental medical topics into theoretical practice.
(2) By obtaining appropriate and adequate scholarship and experience in orthodontic medicine, to amass adequate knowledge and clinical experience to be a highly developed practitioner of specialist medicine.

5. Forma

Class sizes will be small.

6. Course Description

To aim to acquire the knowledge in fundamental medicine and the ability to think, necessary for research topics and clinical work, through research training in the fundamental medical practice of orthodontic science.
To absorb leading edge knowledge from lectures in educational groups, and to absorb the ability to think theoretically as a basis for debate from presentations and questions at review meetings.

7. Grading System

Assessment will be based on evaluation of engagement in research practice in educational groups in each academic year, and content of presentations and remarks. In addition, there will be holistic evaluation of research content and degree of contribution to research and research meetings and frequency of academic presentations.

8. Prerequisite Reading

Prior to lectures, exercises, and research internships, contact the instructor, confirm the course content, and acquire the necessary knowledge in advance through the following reference materials, etc.

9. Reference Materials

Contemporary Orthodontics 6th edition, Proffit WR, Elsevier Mosby, 2019, ISBN: 9780323543873

Instructions will be given from time to time in relation to a wide variety of references and papers relating to orthodontic science research and clinical orthodontics.

10. Important Course Requirements

Provide advance notice if to be unavoidably absent.

11. Availability in English

Yes.

12. Office Hours

Contact person: Takashi Ono
Field of Orthodontic Science
Mon - Fri., 16:00–17:00
E-mail t.ono.orts@tmd.ac.jp

13. Note(s) to Students

None.

Orthodontic Science Experimentation and Thesis Writing

Experiment and Practice (Code: 1003, 2nd~5th year (2nd semester): 10 units)

1. Instructors

Professor: Takashi Ono, Eriko Marukawa
Lecturers: Yoshiro Matsumoto, Jun Hosomichi
Assistant Professors: Ippei Watari, Ikuo Yonemitsu, Yuji Ishida, Risa Usumi
Project Assistant Professor: Chiho Kato

2. Classroom/Lab

Check with your supervisor in advance.

3. Course Purpose and Outline

(Purpose)
The purpose of Orthodontic Science is to nurture or improve and further maintain the ability of the occlusal system—comprising teeth, periodontium, jawbones, temporomandibular joints and their associated structures—to be preserved in a healthy state and maintain physiological function, from infancy through to old age. This class subject will facilitate learning of methods for fundamental and clinical research in orthodontic science and teach methods for drawing up and putting into practice research plans and for consolidating and publicizing those results in a research thesis. Further, given it is in the clinical field, the objective is to nurture highly developed orthodontists who have the fundamentals of orthodontic science and orthodontics and clinical knowledge and techniques

(Outline)
As is appropriate to the above purpose, students will be assigned to the following research groups for individual teaching in research practice.

1. Research in biochemistry, tissue cell chemistry, molecular biology and functional anatomical research relevant to the morphology and function of hard and soft tissue of the teeth, periodontium, occlusion, temporomandibular joint and maxillofacial cranium.
2. Research in fundamental physiology, clinical physiology and radiology relevant to stomatognathic function, including chewing, swallowing, pronunciation and breathing, and brain function, including memory, learning, cognition and behaviour.
3. Research in inorganic metallic materials science, bio-organic materials science and materials biomechanics relevant to clinical orthodontics.

4. Course Objective(s)

(1) To acquire appropriate and adequate scholarship and ability to think for the purposes of experimentation and thesis writing relevant to fundamental medical research in orthodontic science, and to absorb the ability and knowledge to draw up and progress theoretical research in accordance with research topics.
(2) To master the ability to appropriately process and analyze research results, conduct comparative analysis against wide reading of leading research, and consolidate into and publish as an academic thesis.

5. Forma

Class sizes will be small.

6. Course Description

To aim to acquire the knowledge and ability to think, necessary for research topics and clinical research through experimentation and thesis writing relevant to orthodontic science.
To absorb leading edge knowledge from research group progress meetings, and to absorb the ability to think theoretically as a basis for debate from presentations and questions at meetings.

7. Grading System

Assessment will be based on evaluation of engagement in research group progress meetings and experiments, and content of presentations and remarks. In addition, there will be holistic evaluation of research content, degree of involvement in research and research meetings and frequency of academic presentations.

8. Prerequisite Reading

Prior to lectures, exercises, and research internships, contact the instructor, confirm the course content, and acquire the necessary knowledge in advance through the following reference materials, etc.

9. Reference Materials

Contemporary Orthodontics 6th edition, Proffit WR, Elsevier Mosby, 2019, ISBN: 9780323543873

Instructions will be given from time to time in relation to a wide variety of references and papers relating to orthodontic science research and clinical orthodontics.

10. Important Course Requirements

Provide advance notice if to be unavoidably absent.

11. Availability in English

Yes.

12. Office Hours

Contact person: Takashi Ono
Field of Orthodontic Science
Mon - Fri., 16:00–17:00
E-mail t.ono.orts@tmd.ac.jp

13. Note(s) to Students

None.

Maxillofacial Orthognathics Special Lecture

Lecture(Code:1101, 2nd year (1st semester): 6 units)

1. Instructors

Professor: Keiji Moriyama
Associate Professor: Takuya Ogawa
Lecturer: Norihisa Higashihori
Assistant Professors: Michiko Tsuji, Yukiho Kobayashi, Masayoshi Uezono, Takeshi Ogasawara

2. Classroom/Lab

Check with your supervisor in advance of the lesson.

3. Course Purpose and Outline

(Purpose)
To deepen understanding from a clinical dentistry perspective of morphological and functional abnormalities in the maxillofacial cranium region provoked by pre and post-natal growth and developmental abnormalities, and to master the latest diagnostic, treatment and prevention methods. In addition, to learn various methods of test and analysis for patients with congenital abnormalities and jaw deformity, and to study diagnosis and drawing up of treatment plans with reference to clinical trial cases. Further, to learn how to make orthodontic devices, and to use modelling to deepen understanding of their action mechanisms.

(Outline)
1. Understand normal growth and development and function of teeth, periodontium, maxillofacial cranium and associated muscular soft tissue systems.
2. Learn how to build databases necessary for diagnosis from medical examinations, tests and analytical data from clinical orthodontic cases relating to maxillofacial orthognathics.
3. Extract problems from the perspective of maxillofacial orthognathics from clinical orthodontic cases, and understand diagnosis and methods for setting treatment goals.
4. Understand drawing up of treatment plans in accordance with treatment goals to improve occlusal and morphological abnormalities due to infelicitous structures.
5. Understand comprehensive treatment methods incorporating surgical and denture treatments in addition to general dental orthodontic treatment, across the treatment process in individual clinical cases.

4. Course Objective(s)

To be able to explain the skeletal structure system in the oral and maxillofacial cranium, mechanisms which give rise to congenital and growth and development abnormalities in muscular soft tissue systems, and their diagnosis and treatment methods.

5. Forma

Class sizes will be small.

6. Course Description

To understand morphological abnormalities in the maxillofacial cranial region provoked by pre and post natal growth and developmental abnormalities from the perspective of clinical dentistry. Further, to explain the genetic and developmental morphogenetic background to congenital complaints, and provide the most up-to- date information on their diagnosis and methods of treatment.

7. Grading System

Holistic evaluation based on engagement in lectures, research content and engagement in research.

8. Prerequisite Reading

In advance of lessons, seminars, and research practice, liaise with supervisor to confirm lecture content and acquire necessary knowledge from reference materials.

9. Reference Materials

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

10. Important Course Requirements

None.

11. Availability in English

Yes.

12. Office Hours

Contact person: Keiji Moriyama
Field of Maxillofacial Orthognathics
E-mail Mon - Thu., 16:00–17:00 k-moriyama.mort@tmd.ac.jp

13. Note(s) to Students

None.

Maxillofacial Orthognathics Research Practice

Practice(Code: 1102, 2nd year (full year): 8 units)

1. Instructors

Professor: Keiji Moriyama
Associate Professor: Takuya Ogawa
Lecturer: Norihisa Higashihori
Assistant Professors: Michiko Tsuji, Yukiho Kobayashi, Masayoshi Uezono, Takeshi Ogasawara

2. Classroom/Lab

Check with your supervisor in advance of the lesson.

3. Course Purpose and Outline

(Purpose)
To understand normal growth and development and function of the teeth, periodontium, maxillofacial cranium and their associated muscular soft tissue systems, and also the maxillofacial orthognathic treatment and prevention of morbidity resulting from abnormalities in those structures. In addition, to acquire methods of research into the cause, diagnosis, treatment and prevention of morphological and functional abnormalities in the maxillofacial cranium region provoked by pre and post-natal growth and developmental abnormalities. Further, to reveal the factors and mechanisms involved in congenital abnormalities and pathogenesis of jaw deformity, and to deepen understanding of specific research methods for the development of methods of treatment and prevention.

(Outline)
1. Methods for collecting and analyzing relevant literature.
2. Drawing up an appropriate experimental plan based on ethical guidelines.
3. Methods for appropriate handling of bioresources and lab animals.
4. Methods of research in molecular genetics, molecular biology, tissue science and biocompatible materials engineering and methods for handling associated research equipment.
5. Methods of clinical and epidemiological research.

4. Course Objective(s)

To be able to explain the mechanisms which give rise to congenital and growth and development abnormalities in skeletal structure and muscular soft tissue systems in the oral and maxillofacial cranium, and how to draw up plans for research into their diagnosis and methods of treatment and experimental methods.

5. Forma

Class sizes will be small.

6. Course Description

Appropriate diagnosis and drawing up treatment plans for patients with congenital abnormalities and jaw deformity are extremely important, because treatment requires alignment with other fields of dentistry, including orthodontics, surgery and dentures. Fundamental research approaches into various test methods, analytical methods, diagnosis and drawing up of treatment plans for patients with congenital abnormalities and jaw deformity will be studied in seminars.

7. Grading System

Holistic evaluation based on engagement in research practice, research content and engagement in research.

8. Prerequisite Reading

In advance of lessons, seminars, and research practice, liaise with supervisor to confirm lecture content and acquire necessary knowledge from reference materials.

9. Reference Materials

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

10. Important Course Requirements

None.

11. Availability in English

Yes.

12. Office Hours

Contact person: Keiji Moriyama
Field of Maxillofacial Orthognathics
E-mail Mon - Thu., 16:00–17:00 k-moriyama.mort@tmd.ac.jp

13. Note(s) to Students

None.

Maxillofacial Orthognathics Experimentation and Thesis Writing

Experiment and Practice(Code: 1103, 2nd ~ 5th year (2nd semester): 10 units)

1. Instructors

Professor: Keiji Moriyama
Associate Professor: Takuya Ogawa
Lecturer: Norihisa Higashihori
Assistant Professors: Michiko Tsuji, Yukiho Kobayashi, Masayoshi Uezono, Takeshi Ogasawatra

2. Classroom/Lab

Check with your supervisor in advance of the lesson.

3. Course Purpose and Outline

(Purpose)
In addition to the normal growth and development and function of the teeth, periodontium, maxillofacial cranium and their associated muscular soft tissue systems, to establish a research topic into improvements in and the prevention of occlusal and morphological abnormalities due to abnormalities in these structures. Further, to postulate an experimental hypothesis for experimental verification based on the scientific method, to add inquiry into the results obtained and to complete a thesis.

(Outline)
In one of the following research groups, to conduct experiments and write theses on individual topics.

(1) Clinical Evaluation and Medical Verification Group: Conduct clinical research based on tests, analysis, diagnosis and treatment data from patients with congenital abnormalities and jaw deformity.
(2) Clinical Informatics Group: Use clinical statistical methods to gather objective maxillofacial orthognathic evidence and configure fundamental data that will contribute to future development in dental medicine.
(3) Biomarker Investigation Group: Analyze investigation into causative genes and pathological development mechanisms, using molecular genetic and molecular biological methods to reveal factors and mechanisms of pathogenesis involved in congenital abnormalities and the formation of jaw deformity.
(4) Stomatognathic Function Sensing: Reveal the specifics of stomatognathic function in patients with congenital abnormalities or jaw deformity and investigate the relationship to the high order central nervous system.
(5) New Device and Imaging Technology Development: Use imaging and information to develop devices for simulating treatment and evaluating stomatognathic function.

4. Course Objective(s)

To be able to explain the mechanisms that cause congenital, growth and developmental abnormalities in skeletal structure and muscular soft tissue systems in the oral and maxillofacial cranium, and their diagnosis and methods of treatment.

5. Forma

Class sizes will be small.

6. Course Description

Reveal factors and mechanisms of pathogenesis involved in congenital abnormalities or jaw deformity and accomplish research into new methods of treatment and prevention.

Deepen understanding of the management of research data in accordance with ethical research guidelines, and provide practical instruction in methods of writing scientific theses.

7. Grading System

Holistic evaluation based on engagement in experiments, research content and engagement in research.

8. Prerequisite Reading

In advance of lessons, seminars, and research practice, liaise with supervisor to confirm lecture content and acquire necessary knowledge from reference materials.

9. Reference Materials

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

10. Important Course Requirements

None.

11. Availability in English

Yes.

12. Office Hours

Contact person: Keiji Moriyama
Field of Maxillofacial Orthognathics
E-mail Mon - Thu., 16:00–17:00 k-moriyama.mort@tmd.ac.jp

13. Note(s) to Students

None.

4. Information for Students

1) Contact and Notification

Notifications and other information are posted on university bulletin boards or the TMDU website (Click on the tab for “Current Students” or “Schools/Graduate Schools”.)

When emergency measures for natural or weather-related disasters such as typhoons are taken, causing the full suspension of public transportation services, lectures and examinations may be canceled or rescheduled. Notifications of such will be announced on the TMDU website (Click on the tab for “Schools / Graduate Schools-News & Events”).

Bulletin boards are located in front of Bldg. 6, in front of the Educational Planning Section on the 1st floor of Bldg. 1 and in front of the Student Support Office on the 3rd floor of Bldg. 5. Please check these boards regularly.

When necessary, students will be contacted individually on the phone, via email or by mail. If your address or phone number changes, please update your contact information with the Educational Planning Section.

2) Student ID Card

Your student ID card serves as proof of student status and as a nametag. It is also an IC card and will enable you to unlock some school entrances and register your attendance for classes. Please be careful not to damage or lose it.

Additionally, please carry your student ID card with you at all times. You may also be asked to show it when you buy a commuter pass.

(1) Reissuance

Students should promptly notify the Educational Planning Section if their ID card has been lost or damaged, and complete the procedures to have the card reissued. Please note that a fee will be charged for reissuance.

(2) Return of card

Students should promptly return their ID card to the Educational Planning Section upon graduation, withdrawal or expulsion, or when the card expires. Please note that if the card has been lost and cannot be returned, a fee will be charged equal to that of reissuance.

(3) Updating the period of validity

If your enrollment period has been extended and your student ID card has expired, please visit the Educational Planning Section to update your card.

(TEL: 03-5803-5074)

3) Certificates

Some certificates and other official documents are issued by JD & MPH Unit, International Exchange Section, while others may be obtained from automatic document issuing machines.

<table>
<tr><th>Place</th><th>Items</th><th>Service hours</th><th>Office</th></tr>
<tr><td rowspan="2">Document vending machine
Bldg. 5, 4th floor
Student Lounge</td><td>Certificate of Enrollment (Japanese)</td><td rowspan="2">8:30-21:00
(Student ID card is required.)</td><td rowspan="2">Thesis and Dissertation Team, Educational Planning Section
TEL : 5803-5074</td></tr>
<tr><td>Student Discount Card for JR</td></tr>
<tr><td rowspan="4">JD & MPH Unit, International Exchange Section*
Bldg. 1, 4th floor</td><td>Certificate of Enrollment (English)</td><td rowspan="4">8:30-17:15</td><td rowspan="4">JD & MPH Unit, International Exchange Section
TEL : 5803-4678</td></tr>
<tr><td>Transcript (Japanese/English)</td></tr>
<tr><td>Certificate of Expected Graduation <Master’s Program> (Japanese/English)</td></tr>
<tr><td>Other certificates (Japanese/English)</td></tr>
<tr><td>Educational Planning Section*
Bldg. 1, 1st floor
Educational Planning Section*
Bldg. 1, 1st floor</td><td>Certificate of Expected Graduation <Doctoral Program> (Japanese/English)</td><td>8:30-17:15</td><td>Thesis and Dissertation Team, Educational Planning Section
TEL : 5803-5074</td></tr>
</table>

*Certificates issued by the JD & MPH Unit, International Exchange Section

Please visit the JD & MPH Unit, International Exchange Section and submit the relevant application form. It may take a few days to issue a Japanese certificate and about a week for an English certificate.

*Certificates for those who have already completed a course are also issued by JD & MPH Unit, International Exchange Section.

Available certificates are: Certificate of Awarded Diploma, Transcript, Certificate of Past Enrollment, and Certificate of Degree.

How to apply for a certificate by mail

If you need to apply for a certificate that is not available from the document vending machines, you can send the application form by mail to the following address. Please send the application form along with a self-addressed envelope with a 120-yen stamp affixed. The envelope should be at least 240×332 mm in size so that an A4 size document can be inserted without folding.

Address

JD & MPH Unit, International Exchange Section, Tokyo Medical and Dental University
1-5-45 Yushima, Bunkyo-ku, Tokyo
Postal code: 113-8510

4) **Student Discount Card for JR**

(1) Students can get a 20% discount on JR Line tickets for travel that exceeds 100 kilometers one way. The purpose of this service is to help ease students' financial burden and promote school education. You can use the Student Discount Card at JR for a maximum of 10 tickets per person per year, and the card is valid for 3 months.

(2) Caution: Please do not use this service in an inappropriate or illegal manner.
Do not:
1. Buy a discounted ticket by using the student ID card of another person.
2. Give someone a ticket that you bought.
3. Use an expired ticket.

If you commit any of these actions, you may be required to pay a penalty of twice the regular fare. Furthermore, this service for all students at TMDU may be suspended as a result.

(3) The Student Discount Card for JR is available from the document vending machines in the Student Lounge in Bldg. 5, 4th floor.

Service hours: 8:30 a.m. to 9:00 p.m. on weekdays
Office: Educational Planning Section (TEL: 03-5803-5074)

5) Change of address/surname/ legal domicile/telephone number

A student who changes his/her address, legal domicile, surname or telephone number must promptly notify Graduate Education Team 1 or 2 in the Educational Planning Section and follow the necessary procedures. A student who has a change in their guarantor's information must also do the same.
If you fail to inform the Educational Planning Section of any changes, the university may not be able to contact you in case of an emergency.

Office

JD & MPH Unit, International Exchange Section (Bldg. 1, 4th floor)

Notification form

	Form	Necessary documents
Change of surname	Change of name form	Proof of name change
Change of address or legal domicile	Change of address or legal domicile form	Proof of change of address or legal domicile
Change of guarantor	Change of guarantor form	N/A

6) Request for permission to attend external practical training

If you would like to attend an external practical training course, you must submit the request form to JD & MPH Unit, International Exchange Section two weeks before the start date. (If you would like to attend training abroad, you must submit your request two months before the start date.)

7) Lost and found property

Lost property found on the university campus is handled by the following offices.

(1) Lost property found inside the building of the Faculty of Medicine:
General Affairs Section, Administration Division, Faculty of Medicine
(Bldg. 3, 6th floor, TEL: 5803-5096)

(2) Lost property found inside the building of the Faculty of Dentistry:
General Affairs Section, Administration Division, Faculty of Dentistry and Dental Hospital (Dental Bldg. South, 2nd floor, TEL: 03-5803-5406)

(3) Lost property found in other places: Campus security and building safety offices.

8) Health Service Center

(Health Service Center: TEL 03-5803 - 5081、http://www.tmd.ac.jp/hsc/index.html)

The Health Service Center aims to help students and faculty members stay healthy so that they can pursue their activities effectively. TMDU staff and students visit the center to get counseling for physical or mental issues, physical examinations, and letters of introduction necessary to visit specialists.

(1) Health consultation and counseling for mental health

1. Health consultation is available from 10 a.m. to 12:30 p.m. and 1:30 p.m. to 3:30 p.m. on weekdays.
2. For information concerning which doctors are available, please check the Health Administration Center website.
3. You may consult with doctors or health consultants even after official consultation hours if they are still in the center.
4. You may also freely use the center's scales to measure your height and weight, or the blood pressure machine.

(2) Health checkup

All students are obliged to complete a health checkup. It is the student's responsibility to check the Health Administration Center website for the detailed schedule of examinations.

1. Annual Health Checkup — May
2. Detection of HBs Antigen — April
3. Health Checkup for Radiation Workers — April and October
4. Others: Immunization for Hepatitis B or Influenza bacilli

(3) Health certificate issuance

Health certificates can be issued when needed for taking a qualifying examination, applying for clinical training at a hospital, job hunting or entering a different school. Note that the certificate can only be issued to students who have taken the annual health checkup.

9) Student support

Support Center for Students and Female Staff:
(http://www.tmd.ac.jp/cmn/stdc/index_en.html)

The Support Center for Students and Female Staff assists students with managing their daily life such as schoolwork and career planning, provides counseling for mental health issues and harassment, and promotes other student support activities. The center also implements plans for supporting research activities and work-life balance for both female and male researchers and graduate students.

If you have problems in your daily life as a student, you can talk to a counselor. Based upon your needs, choose the appropriate contact number below.

<For matters related to student life>

TEL：03-5803-4959
(http://www.tmd.ac.jp/cgi-bin/stdc/cms_reserv.cgi?lang=_en)

- Personal life: family, financial circumstances, relationship problems, etc.
- Schoolwork: progress in school, continued education, relationships with students or faculty
- Career planning: post-graduation decisions, job hunting
- Mental health: stress, unstable mental condition, interpersonal relationships

・Harassment: Academic dishonesty, power harassment, sexual harassment, etc.

<For matters related to student life or career support and work-life balance>

TEL: 03-5803-4921

(http://www.tmd.ac.jp/ang/counsel/index.html)

・Future career decisions and lifestyle
・Work-life balance and events such as pregnancy, childbirth and parenting
・Concerns about nursery schools or nursing care

☆Individual counseling: 10:30 a.m. to 5:00 p.m. on weekdays

Typically, you need to make a reservation for an individual counseling session. However, a counselor will try to respond to your request even when you do not have a reservation.

10) Graduate student lounge

Any graduate student can use the lounges located in M&D Tower on the 22nd and 14th floors.

<Available hours> 8:00 a.m. to 9:00 p.m.

<Notes>

1. Please keep the lounge tidy.
2. Please dispose of your garbage in your laboratory. Do not dispose of it in nearby classroom trashcans.
3. Please do not bother others. For example, avoid talking loudly, sleeping for too long, or bringing outside playthings to the lounge.
4. Please do not leave your belongings in the lounge.

11) Others

(1) If you plan to receive personal mail, please tell the sender to include the name of your department in the address field.

(2) TMDU imposes traffic restrictions on campus and commuting by car is prohibited. However, an exception may be made for students who have difficulty commuting to campus by train or bus.

(3) Relevant Offices

1. Academic affairs:
   JD & MPH Unit, International Exchange Section
   (Bldg. 1, 4th floor, TEL 5803-4678)
2. Payment of tuition:
   Financial Planning Section (Bldg. 1, 3rd floor, TEL 5803-5048)
3. Scholarships and tuition exemption:
   Student Support Office (Bldg. 5, 3rd floor, TEL 5803-5077)

5. Major facilities

Facility name	Location	Extension number
International Exchange Section	Bldg. 1, 4F	4678 (JD & MPH Team)
Student Support Office	Bldg. 5, 3F	5077
Educational Planning Section	Bldg. 1, 1F	5074 (Thesis and Dissertation Unit) 4676,4679,4534 (Graduate Education Unit 1, 2)
Admission Section	Bldg. 1, 1F	4924
Financial Planning Section	Bldg. 1, 3F	5042
Library	M&D Tower, 3F	5592
Health Administration Center	Bldg. 5, 2F	5081
Student Lounge (Certificate Vending Machine)	Bldg. 5, 4F	—
University Co-op Cafeteria and shop	Bldg. 5, 1F, B1F	—
Research Center for Medical and Dental Sciences	Bldg. 8, North, South	5788

6. Campus/Access Map