

**Doctor of Philosophy Program in Oral Health Sciences**  
**(International program revised in 2023)**

**Plan 2: Research and coursework/clinical plan**

<b>Course and study plan in Ph.D.</b>			
<b>Year</b>	<b>Semester</b>	<b>2.1 (Research+Coursework /Clinical practice)</b> (Master's degree based, 3 years)	<b>2.2 (Research+Coursework /Clinical practice)</b> (Bachelor degree based, 4 years)
		<b>Thesis 36+Course 12</b> -Compulsory course: 4 -Elective course: 8 <b>-Thesis: 48</b>	<b>Thesis 48+Course 24</b> -Compulsory course: 7 -Elective course: 17 <b>-Thesis: 48</b>
First year	Sem1	xxx Compulsory course (4)	xxx Compulsory course (7)
		xxx Elective course	xxx Elective course
		650-921 Thesis (2)	650-922 Thesis (2)
		65x-95x Seminar/Special**	65x-95x Seminar/Special**
	Sem2	xxx Elective course	xxx Elective course
		650-921 Thesis (4)	650-922 Thesis (2)
65x-95x Seminar/Special**		65x-95x Seminar/Special**	
Second year	Sem1	xxx Elective course	xxx Elective course
		650-921 Thesis (6)	650-922 Thesis (6)
		65x-95x Seminar/Special**	65x-95x Seminar/Special**
	Sem2	650-921 Thesis (8)	xxx Elective course
			650-922 Thesis (6)
Third year	Sem1	650-921 Thesis (8)	650-922 Thesis (8)
	Sem2	650-921 Thesis (8)	650-922 Thesis (8)
Fourth year	Sem1	-	650-922 Thesis (8)
	Sem2	-	650-922 Thesis (8)
		(**: Register with or without credit depending on advisor's consideration)	

Algorithm of the study in PhD program			
Year	Semester	2.1 (Research+Coursework /Clinical practice) (Master's degree based) 3-year period	2.2 (Research+Coursework /Clinical practice) (Bachelor degree based) 4-year period
First year	Sem1	Supervisor appointment	Supervisor appointment
		Course registration	Course registration
	Sem2	Qualification examination	Qualification examination
		Course registration	Course registration
Second year	Sem1	Thesis proposal examination	Course registration
		Course registration	Data collection/ research work
	Sem2	Data collection/ research work	Thesis proposal examination
		Manuscript submission 1	Manuscript submission 1
			Course registration
Third year	Sem1	Paper acceptance/ publication	Data collection/ research work
	Sem2	Thesis defense	
Fourth year	Sem1	-	Paper acceptance/ publication
	Sem2		Thesis defense

## Course content

<b><u>Compulsory courses</u></b>		
<b>Code</b>	<b>Title</b>	<b>Credit</b>
650-713	Research Methodology in Oral Sciences	2(2-0-4)
650-716	Current Advances in Biomedical Sciences	1((1)-0-2)
650-952	Special Seminar in Oral Health Sciences	1(0-2-1)
660-711	Philosophy and Methodology of Dental Research	2((2)-0-4)
660-715	Advanced Oral Science	3((3)-0-6)

### **Specific elective courses**

347-532	Applied Statistics for Research	3((3)-0-6)
347-551	Medical Statistics and Statistical Computing 1	4(3-2-7)
650-712	Basic Biomedical Sciences in Clinical Practice	2((2)-0-4)
650-765	Applied Statistical Program in Dental Research	1(0-2-1)
650-794	Applied Biostatistics in Oral Sciences	2(1-3-2)
685-793	Advanced Biomedical Sciences and Application	3((2)-3-4)
685-893	Academic Reading and Writing	2((1)-2-3)

### **General elective courses**

#### **Category 1: Oral Sciences**

##### Courses offered by Faculty of Sciences

318-511	Genetic Engineering	3(2-3-4)
336-521	Toxicology	2(2-0-4)

##### Courses offered by Faculty of Dentistry

650-751	Seminar in Digital Dental Technology	1(0-2-1)
650-796	Module: Advance Explicit and Research Methodology in Oral Health Sciences	5((4)-3-8)
651-912	Instrumentation for Oral Biology Research	1((1)-0-2)
651-921	Electronmicroscopic Laboratory	1(0-1-2)
651-922	Biotechnology for Research in Oral Sciences	3((1-6-2)
651-951	Special Topics in Oral Science I	2(0-4-2)
651-952	Special Topics in Oral Science II	2(0-4-2)
651-953	Special Topics in Oral Science III	2(0-4-2)
685-792	Advanced Oral Microbiology and Immunology	2((1)-3-2)

#### **Category 2: Clinical and Oral Public Health Research**

##### Courses offered by Faculty of Medicine

352-521	Epidemiological Methods I	3((3)-0-6)
352-525	Epidemiological Methods II	3((3)-0-6)
352-526	Advanced Medical Statistics and Medical Data Analysis	3((2)-2-5)
352-528	Qualitative Research	3((1)-4-4)

##### Courses offered by Faculty of Dentistry

652-951	Special Topics in Oral Public Health I	2(0-4-2)
652-952	Special Topics in Oral Public Health II	2(0-4-2)
652-953	Special Topics in Oral Public Health III	2(0-4-2)
671-713	Applied Oral Epidemiology	2(0-4-2)
671-716	Oral Health Promotion	3((3)-0-6)
671-717	Qualitative Research	1((1)-0-2)

671-791	Data Management in Dentistry	1((1)-0-2)
671-811	Health System and Oral Health System	2(1-2-3)
671-812	Applied Social Science in Dentistry	1((1)-0-2)

**Category 3: Dental Materials**

Courses offered by Faculty of Dentistry

653-951	Special Topics in Dental Materials I	2(0-4-2)
653-952	Special Topics in Dental Materials II	2(0-4-2)
653-953	Special Topics in Dental Materials III	2(0-4-2)
653-991	Material Properties and Biocompatibility Testing	3((1)-6-2)
667-792	Advanced Dental Materials	2((2)-0-4)

**Thesis**

650-911	Thesis (Plan 1.1)	48(0-144-0)
650-912	Thesis (Plan 1.2)	72(0-216-0)
650-921	Thesis (Plan 2.1)	36(0-108-0)
650-922	Thesis (Plan 2.2)	48(0-144-0)

## Course description

<b>Course description</b>			
<b>Compulsory courses</b>			
<b>Code</b>	<b>Title</b>	<b>Credit</b>	<b>Description</b>
650-713	Research Methodology in Oral Sciences	2(2-0-4)	Definition and concept of research methodology, hypothesis, identification and design of research questions; variables; bias; confounders and control; presentation; research ethics; practicing how to develop research proposal and thesis preparation related to students own thesis
650-716	Current Advances in Biomedical Sciences	1((1)-0-2)	Conceptual and applied knowledge in current advance technology; concepts, innovation and controversy in medical sciences related to the evolution of diagnosis, prognosis and treatment; biological conditions in oral and maxillofacial; self-learning principle about new technology
650-952	Special Seminar in Oral Health Sciences	1(0-2-1)	Seminar in advanced topics in research which related to the thesis topics
660-711	Philosophy and Methodology of Dental Research	2((2)-0-4)	Definition and types of research, principle in acquiring knowledge, reliability of research tools, analysis of problems, research design, research ethics, critical appraisal of scientific paper
660-715	Advanced Oral Science	3((3)-0-6)	Molecular biology of craniofacial development, cleft lip and palate, current concepts of tooth eruption, molecular mechanisms of oral cancer, wound healing, tissue engineering, basic science of the prevention of dental caries and periodontal diseases, application of molecular biology in dental research
<b>Specific elective courses</b>			
347-532	Applied Statistics for Research	3((3)-0-6)	Introduction to data analysis; normal distribution; sampling distributions estimation and hypothesis testing; one way analysis of variance; correlation and simple linear regression analysis; correlation and multiple linear regression; Chi-square test; strategies for selecting appropriate statistical methods; computer software applications
347-551	Medical Statistics and Statistical Computing 1	4(3-2-7)	Descriptive statistics; probability theory; binomial distribution; Poisson distribution; normal distribution; sampling distribution, estimations and hypothesis testing; one way analysis of variance; categorical data analysis using Chi-square distribution; correlation and simple linear regression analysis; multiple linear regression; nonparametric statistics; computer software applications

650-712	Basic Biomedical Sciences in Clinical Practice	2((2)-0-4)	Knowledge and concept of biology, microbiology and physiology of the oral and maxillofacial region; mechanism of wound healing; physical reaction to foreign bodies; craniofacial development and growth of the oral and maxillofacial region in embryology and genetics; carcinogenesis in oral cavities; immunodeficiency diseases; materials used in medicine; computer knowledge in the diagnosis of the disease
650-765	Applied Statistical Program in Dental Research	1(0-2-1)	Practice in computer laboratory-statistical analysis and computer software data management
650-794	Applied Biostatistics in Oral Sciences	2(1-3-2)	Management and analysis of statistical data; concept, principle, theoretical application, using of statistical package for data analysis and data presentation; nonparametric statistic, estimation, group comparing, association and prediction, statistical analysis for multiple variables, sample size calculation
685-793	Advanced Biomedical Sciences and Application	3((2)-3-4)	Knowledge and current concepts of molecular biology, bioinformatics, cell biology, oral ecology, microbiology and immunology including its application in dental research
685-893	Academic Reading and Writing	2((1)-2-3)	Practice relate to reading, analysis and appraisal; writing research report and manuscript; ethic in academic writing

**General elective courses**

**Category 1: Oral Sciences**

Courses offered by Faculty of Sciences

318-511	Genetic Engineering	3(2-3-4)	Definition and application of genetic engineering, structure and function of DNA, flow of genetic information, recombinant DNA technology, cloning, site directed mutagenesis, sequencing, gene expression, the impacts of genetic engineering in medicine, environmental science and agriculture, biosafety control
336-521	Toxicology	2(2-0-4)	Principle of Toxicology, classification, sources, physico-chemical properties of toxic agents, toxicity evaluation; factors affecting toxicity; dose-response relationship of toxic agents; mechanism of toxicity at molecular, cellular, tissue and organ levels: poisoning diagnosis, toxic signs and symptoms, treatment of poisoning

Courses offered by Faculty of Dentistry

650-751	Seminar in Digital Dental Technology	1(0-2-1)	Combined studying approaches of current dental literature relevant to digital dental technology for clinical treatment, laboratories using digital technology to fabricate restorations emphasizing on the analysis, criticism of updated technology, and case presentations
---------	--------------------------------------	----------	--

650-796	Module : Advance Explicit and Research Methodology in Oral Health Sciences	5((4)-3-8)	Advance knowledge and update concept of biology, microbiology and physiology of the oral and maxillofacial region; craniofacial development and growth of the oral and maxillofacial region and genetics; carcinogenesis in oral cavities; immunodeficiency diseases; concept of research methodology; hypothesis; identification and design of research questions in dentistry: develop and present research proposal in dentistry
651-912	Instrumentation for Oral Biology Research	1((1)-0-2)	Principles and operation of research instruments for oral biology including advanced microscopes, high performance liquid chromatography, X-ray diffractometer, infra-red spectrophotometer, scintillation counter, densitometer, image analyzer, etc
651-921	Electronmicroscopic Laboratory	1(0-1-2)	Laboratory practice in tissue preparation of soft and hard tissue from orofacial structures for study with transmission and scanning electron microscope; the procedure of operation of electron microscope; electron microscopic photography; electron micrograph interpretation
651-922	Biotechnology for Research in Oral Sciences	3((1-6-2)	The knowledge of molecular biology relate to analysis extraction and purification of DNA and protein, cloning, tissue culture and bioinformatics for application in dental research
651-951	Special Topics in Oral Science I	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral health science, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
651-952	Special Topics in Oral Science II	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral health science, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
651-953	Special Topics in Oral Science III	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral health science, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
685-792	Advanced Oral Microbiology and Immunology	2((1)-3-2)	The advanced knowledge of mechanisms of infection and immunology in the oral cavity; interaction between host and microorganisms; principles of transmission and infection control; practice and gain experience in specimen collection, identification and antimicrobial susceptibility test, interpretation of laboratory reports in relation to clinical symptoms

<b>Category 2: Clinical and Oral Public Health Research</b>			
<u>Courses offered by Faculty of Medicine</u>			
352-521	Epidemiological Methods I	3((3)-0-6)	Scientific reasoning, health indicators, health program priority setting, measures of risk, causation, confounding and interaction, bias, sampling techniques, measurement and data collection, research and development in health, burden of disease
352-525	Epidemiological Methods II	3((3)-0-6)	Introduction to study design, descriptive study, cross-sectional study, case control study, cohort study, clinical trial, community experimental, validity and reliability, systematic review of RCT, screening, diagnostic test, research ethics
352-526	Advanced Medical Statistics and Medical Data Analysis	3((2)-2-5)	Analysis of 2x2 tables, analysis of confounding and interaction, binary logistic regression, Poisson regression, multinomial and proportional odds logistic regression, survival analysis, sample size and strategies for modeling epidemiological data, big medical data, data mining
352-528	Qualitative Research	3((1)-4-4)	Concepts of qualitative research, conceptual framework, interview techniques, focus group discussion, observation techniques and field work, report writing and presentation
<u>Courses offered by Faculty of Dentistry</u>			
652-951	Special Topics in Oral Public Health I	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral public health, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
652-952	Special Topics in Oral Public Health II	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral public health, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
652-953	Special Topics in Oral Public Health III	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in oral public health, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
671-713	Applied Oral Epidemiology	2(0-4-2)	Epidemiological principles and methods; study designs in epidemiology; measurement of disease distribution; risk factor identification; analysis of epidemiological data; epidemiological techniques and methods for disease investigation; epidemiology and trends of oral diseases and disorders
671-716	Oral Health Promotion	3((3)-0-6)	Principles and concepts of health, holistic health; concepts of prevention and oral health promotion; planning of oral health promotion through community participation with harmonized to the context; current concept of oral



			health promotion planning; social network development and strengthen community in health promotion
671-717	Qualitative Research	1((1)-0-2)	Principles and concepts of qualitative research; techniques, process and research design for combination of qualitative and quantitative research
671-791	Data Management in Dentistry	1((1)-0-2)	Principles and concepts of data management and data analysis; computer programs used in data management; practicing data management using computer software
671-811	Health System and Oral Health System	2(1-2-3)	Principles and concepts of health system, oral health system and health insurance; Current situation of health system, oral health system and impact toward population health
671-812	Applied Social Science in Dentistry	1((1)-0-2)	Philosophy of sciences and social sciences; societal, cultural and political effects on health; understanding conceptual framework and theories in social sciences and anthropology; concepts of health, illness and sickness, pluralistic medical systems, health beliefs, community diagnosis in social sciences aspect; study of relationships between beliefs, values, culture and oral health

### Category 3: Dental Materials

#### Courses offered by Faculty of Dentistry

653-951	Special Topics in Dental Materials I	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in dental materials, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
653-952	Special Topics in Dental Materials II	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in dental materials, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
653-953	Special Topics in Dental Materials III	2(0-4-2)	Seminar and critical reading in advanced topics, controversy or current issues in dental materials, topics should be of mutual interest of faculty and students; reviews and reports on topics are required in the topics selected
653-991	Material Properties and Biocompatibility Testings	3((1)-6-2)	Study and Experiment, material test methods of properties and biocompatibility of materials; Establish a minor material testing project in order to study or to improve material properties and report the result

667-792	Advanced Dental Materials	2((2)-0-4)	Study of structures and properties of materials namely polymer, ceramic, metal and composite, properties related to dental materials selection and testing, types and causes of material failures as well as the prevention, and methods to improve material properties to provide basic foundation for applying material science research, material selection and failure analysis; including seminars on special topics of interest relating to dental materials
<b><u>Thesis</u></b>			
650-911	Thesis (Plan 1.1)	48(0-144-0)	Study and research in Oral Health Science research, produces new holistic knowledge by presenting academic results in English and at least 2 papers published or accepted by international journals under the supervision and guidance from the supervising research committee
650-912	Thesis (Plan 1.2)	72(0-216-0)	Study and research in Oral Health Science research, produces new holistic knowledge by presenting academic results in English and at least 2 papers published or accepted by international journals in English under the supervision and guidance from the supervising research committee
650-921	Thesis (Plan 2.1)	36(0-108-0)	Study and research in Oral Health Science research, produces new holistic knowledge by presenting academic results in English and at least 1 paper published or accepted by an international journal in English under the supervision and guidance from the supervising research committee
650-922	Thesis (Plan 2.2)	48(0-144-0)	Study and research in Oral Health Science research, produces new holistic knowledge by presenting academic results in English and at least 1 paper published or accepted by and international journal in English under the supervision and guidance from the supervising research committee