

Master's Degree in Dentistry and Dental Prosthetics 2023/2024

Integrated Teaching: Orthodontics and Gnathology

Scientific Disciplinary Sector: MED/28

Responsible Professor: Prof. Paola Cozza; e-mail: paola.cozza@unicamillus.org;
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Number of University Educational Credits (CFU): 12

Student reception: on Monday by appointment at UniLabs (Room n.3)

Module: Orthodontics

Scientific Disciplinary Sector: MED/28

Number of University Educational Credits (CFU): 4

Professor: Prof. Paola Cozza (4 CFU); e-mail: paola.cozza@unicamillus.org

Module: Gnathology

Scientific Disciplinary Sector: MED/28

Number of University Educational Credits (CFU): 4

Professor: Prof. Paola Cozza (4 CFU); e-mail: paola.cozza@unicamillus.org

Module: Professional Training Activities

Scientific Disciplinary Sector: MED/28

Number of University Educational Credits (CFU): 4 (CFU 2 Orthodontics; CFU 2 Gnathology)

Professor: Prof. Paola Cozza (4 CFU); e-mail: paola.cozza@unicamillus.org

PREREQUISITES

There are no prerequisites for the Orthodontics and Gnathology courses. However, detailed knowledge of Human Anatomy, Histology, Physics, Physiology and Physiopathology are required.

LEARNING OBJECTIVES

The course aims at providing useful theory and pratics elements of prevention and diagnosis to establish a correct Orthodontic diagnosis which is important to elaborate a correct treatment planning in growing and adolescent patients.

To that end, a special tutoring programs is offered to support the students during the execution and interpretation of the principal orthodontic diagnostic records (Tutor: Brunelli Valerio, Cretella Lombardo Elisabetta, Gazzani Francesca, Loberto Saveria).

The integrated course of Orthodontics and Gnathology provides elements of diagnosis and therapy of TMJ disorders (TMDs) frequently encountered in the clinical practice of Dentistry.

LEARNING OUTCOMES

At the end of the 1st semester, students should know and understand the definition of malocclusion



and its prevention or management guidelines in the different ages. To know basic concepts of cranio-facial growth from 0 to 12 years. Furthermore, students must be able to check the cephalometric landmarks on latero-lateral telerradiography and to locate the most important reference plans and lines of orthodontic cephalometric analysis.

At the end of IInd Semester, students should be able to develop a complete dental casts analysis to individuate: dental arch shape, spacing or crowding in mixed and permanent dentition. Moreover, notions about the physiological masticatory functions, the TMJ movements and TMJ disorder should be known.

At the end of IVth year, students should be able to elaborate a correct orthodontic diagnosis through the knowledge obtained in the Ist and IInd semester.

Knowledge and understanding

The student should demonstrate:

- Knowledge and comprehension about Orthodontics and Gnathology such as:
 - causes of malocclusion;
 - prevention and interception of malocclusion in different age ranges;
 - cranio-facial growth and development;
 - occlusion and dental development;
 - TMJ development;
 - functional analysis of stomatognathic system;
 - imaging in orthodontics and gnathology.
- Acquisition of the relevant guidelines for a correct diagnosis and orthodontic or gnathology treatment planning.
- Achievement of rational diagnostic skills and criteria for the elaboration of procedures prevention and treatment of the pathologies encountered in orthodontic and gnathology.
- Knowledge and understanding about diagnosis, such as:
 - how to make a first orthodontic visit
 - implementation and transmission of dentistry prevention guidelines in different age ranges
 - how to make a first gnathology visit and to understand the imaging for the TMJ.
- Comprehension of all the clinical concepts of dental occlusion, masticatory function and physiopathology of stomatognathic system.
- Knowledge of Temporomandibular joint (TMJ): Anatomy, Physiology and Physiopathology of TMJ.

Applying knowledge and understanding

Students need to acquire analytical problem-solving skills. Students need to know the Evidence Based Medicine and to apply the skills acquired in clinical-practice level.

For this purpose, they will have to be able to update their knowledge through the principal resource websites supporting the search and retrieval of biomedical and life sciences literature.

Communication skills

They also must be able to use a proper scientific language coherent with the topic of discussion. The learners must be able to explain in an organized and consistent manner the main topics of the course



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(treatment planning explication, diagnosis etc.) in order to establish a correct multidisciplinary integration with the patient or other specialist (multidisciplinary approach).

Making judgements

- To acknowledge the importance of the theoretical skills for the future Dentistry profession.
- To understand the theoretical skills acquired and correctly apply them during the clinical practice of the future profession.

Learning skills

Based on the knowledge learned in the Integrated Course, student will be able to critically analyze the skills acquired and profit from them during the clinical practice.

COURSE SYLLABUS

Orthodontics

I. INTRODUCTION ABOUT THE CONCEPT OF ORTHODONTICS

II. ETIOLOGY OF MALOCCLUSION

How and When intervene in different age ranges

0-3 YEARS: NEWBORN PERIOD

- the role of pediatrician;
- psycho-affective development;
- basic concepts of growth and development;
- dental occlusion from 0 to 3 years;
- physiological basis of feeding and breastfeeding;
- oral habits;
- guidelines for the pediatrician: what to do, worry/not worry about of.

3-6 YEARS: PRE-SCHOLAR PERIOD

- the role of pediatrician and pedodontist;
- psycho-affective development;
- basic concepts of growth and development;
- dental occlusion from 3 to 6 years;
- oral habits;
- functional habits;
- guidelines for the pediatrician and pedodontist: what to do, worry/not worry about of.

6-9 YEARS: PRE-PUBESCENT PERIOD

- the role of pedodontist and orthodontist;
- psycho-affective development;
- basic concepts of growth and development;
- dental occlusion from 6 to 9 years;
- pathologic occlusion (malocclusion);
- oral habits;
- guidelines for the pedodontist and orthodontist: what to do, worry/not worry about of.



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9-12 YEARS: PUBERTY PERIOD

- the role of orthodontist;
- psycho-affective development;
- basic concepts of growth and development;
- dental occlusion from 9 to 12 years;
- pathologic occlusion (malocclusion);
- oral habits;
- guidelines for the orthodontist: what to do, worry/not worry about of.

III. CRANIO-FACIAL GROWTH AND DEVELOPMENT Theories of craniofacial growth

Embryonic and postnatal development of the maxilla and the mandible
Development and cranio-facial growth according to D. Enlow

Enlow's counterpart analysis

- identification of landmarks;
- plans and lines construction;
- static phase of counterpart analysis;
- dynamic phase of counterpart analysis;
- discussion of Enlow's counterpart analysis.

Professional Training Activities

execution of the static phase of Enlow's counterpart analysis; execution of the dynamic phase of Enlow's counterpart analysis discussion of cephalometric analysis according to D. Enlow

IV. IMAGING IN ORTHODONTICS Interpreting an orthopantomogram

Cephalometric analysis on latero-lateral telerradiography:

- radioanatomy and identification of skeletal and soft tissue;
- identification of cephalometric landmarks;
- plans and lines construction;
- cephalometric analysis: sagittal, vertical, dental, aesthetic and prediction of growth analysis.
- discussion of cephalometric analysis;
- analysis of skeletal development: wrist/hand x-ray, cervical vertebral maturation method.

Professional Training Activities

execution of the cephalometric analysis; carrying out of the cephalometric analysis; discussion of the cephalometric analysis

V. OCCLUSION AND DENTAL DEVELOPMENT

Development of dentition: deciduous dentition, mixed dentition, permanent dentition
Elements of dental occlusion: deciduous dentition, mixed dentition, permanent dentition
Analysis of dental casts.

Professional Training Activities

- analysis of dental arch shape



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- dental casts analysis in mixed dentition
- dental casts analysis in permanent dentition

COURSE SYLLABUS

Gnathology

I. ANATOMY OF STOMATOGNATHIC SYSTEM AND OF TMJ

Bones of the skull. Masticatory muscles, supra-hyoid and infra-hyoid muscles. Innervation and vascularization of stomatognathic system. Anatomy of the temporomandibular joint (TMJ).

II. PHYSIOLOGY OF THE STOMATOGNATHIC SYSTEM AND TMJ

Principles of physiology and masticatory function. Swallowing, stages of swallowing.

III. PRINCIPLES OF DENTAL OCCLUSION

Tooth morphology and occlusal contacts. Principles and concepts of dental occlusion. Keys of normal occlusion.

IV. MANDIBULAR MOVEMENTS

Rest position. Centric relation. Habitual occlusion. Mandibular movements. Posselt's envelope of motion.

V. ARTICULATORS AND ACCESSORY TOOLS

Types of articulators. Classification of articulators. Facebow and position of the dental casts according to spatial position of teeth. Utilization of articulators.

VI. TEMPOROMANDIBULAR DISORDER (TMDs)

Definition, epidemiology, etiology. Classification of TMDs. Oro-facial pain. Signs and Symptoms of TMDs. Diagnosis: anamnesis and clinical examination. Diagnostic tests.

VII. TREATMENT OF TMDs Principles of treatment of TMDs.

COURSE STRUCTURE

The course is structured in:

- **80** hours of frontal teaching (lectures) during which students will receive the knowledge necessary for subject.
- **50** hours of lab practice (practical exercises) in Orthodontics, during which students will execute, analyze and discuss (supported by tutor) the cephalometric analysis and the analysis of dental casts.
- **50** hours of lab practice in Gnathology differentially distributed in the Healthcare Facilities, Mannequin Classroom or Laboratories during which students will receive the knowledge about the materials commonly used for the creation and finalization of gnathology manufacturing by displaying their use in the laboratory in detail.



COURSE GRADE DETERMINATION

The exam program coincides with the teaching programme. The vote will be expressed in thirtieths. The verification of learning takes place through a written and oral exam.

The **written test** consist of about:

- execution of cephalometric analysis and/or dental casts analysis (mixed or permanent dentition)
- three open questions about cephalometric analysis and/or dental casts analysis.

The written tests lasts 60 minutes.

The oral examination follows the written test.

Each exam is aimed at verifying the degree of knowledge of the notions of the subjects being studied and the ability to relate and interpret the acquired concepts. In particular, the written test aims to verify the level of knowledge of both basic and more in-depth notions and the ability to connect concepts in a logical way. The oral test is aimed at verifying what the student demonstrated in the previous tests, as well as ascertaining his ability to understand and explain concepts with language properties.

Overall, the exam will be evaluated according to the following criteria:

Unsuitable: Poor or lacking knowledge and understanding of the topics; limited capacity for analysis and synthesis, frequent generalisations of the required contents; inability to use technical language.

18-20: Just enough knowledge and understanding of topics, with obvious imperfections; just sufficient capacity for analysis, synthesis and independent judgement; poor ability to use technical language.

21-23: Sufficient knowledge and understanding of topics; sufficient capacity for analysis and synthesis with the ability to logically and coherently argue the required contents; sufficient ability to use technical language.

24-26: Fair knowledge and understanding of the topics; discrete capacity for analysis and synthesis with the ability to rigorously argue the required contents; Good ability to use technical language.

27-29: Good knowledge and understanding of required content; good capacity for analysis and synthesis with the ability to rigorously argue the required contents; good ability to use technical language.

30-30L: Excellent level of knowledge and understanding of the requested contents with an excellent capacity for analysis and synthesis with the ability to argue the requested contents in a rigorous, innovative and original way; Excellent ability to use technical language.

NB. *At the end of the 1st semester will be plan an examination about cephalometric analysis.*

At the end of the 11nd semester will be plan an examination about the dental casts analysis.

The examination will be without mark and aimed simply of knowing the level of learning acquired.



RECOMMENDED TEXTS/BOOKLIST AND BIBLIOGRAPHY

Orthodontics

- Cozza P. **“Ortodonzia in età evolutiva: linee guida di prevenzione e terapia”**. Società Editrice Universo. Roma, 2006
- Proffit WR. **“Ortodonzia Moderna”**. Elsevier-Masson, 2020
- Cozza P, Ballanti F. **“Analisi cefalometrica e diagnosi ortodontica”**. Società Editrice Universo. Roma, 2004
- Cozza P, De Toffol L, Martucci L. **“Sviluppo della dentizione, guida all’occlusione, studio dei modelli in gesso”**. Società Editrice Universo. Roma, 2005
- Cozza P, Mucedero M. **“Sviluppo e crescita cranio-facciale”**. Società Editrice Universo. Roma, 2006
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Gnathology

- Okeson Jeffrey P. **“Il trattamento delle disfunzioni e dei disordini temporomandibolari”**. Martina Edizioni, 7h edition. 2015

OPTIONAL TEXTS/BOOKLIST

- Cozza P, Polimeni A, De Toffol L. *Terapia Miofunzionale*. Ed. Masson, 2002
- Enlow D. *Manuale di crescita cranio-facciale*. Ed. Cides Odonto, 1986
- Rakosi T, Jonas I. *Diagnostica Ortognatodontica*. Ed. Masson, 1992

MATERIALS

Each student will have/receive the following tools for the professional activities and the exams of Ist and IInd semester:

- Latero-lateral Teleradiography (supplied) Acetate sheets (supplied)
- Template and protractor (supplied) Compasses (supplied)
- Wire brass (supplied) Thin pencil Sharpener
- Eraser Scotch
- Black marker for acetate (Lumocolor S)