



EUROPEAN MASTER DEGREE IN ORAL LASER APPLICATIONS

The goal

The master main goal is to realize a platform that aims coalition of components, **optics, laser physics** as well as its properties with **applications in different areas of dentistry**. Moreover, practical and theoretic parts of the course will emphasis on the advantages disadvantages and limits of different therapeutics methods performed conventional or with the aid of laser.

Master's description

The **European Master Degree in Oral Laser Applications** is the first in Europe in the field of dentistry and was born by the scientific and didactical cooperation of several EU university centers.

The EMDOLA project has been operational for more than 4 years in **Liege, Aachen and Nice** and in the last two years four other universities have joined, **Barcelona, Parma, Rome and Timisoara**.

These universities offer a common study program consisting of **10 modules** over the course of **2 years**.

The course is held in **English** and **Romanian** (with simultaneous English-Romanian translation for situations where needed).

Both **Romanian and foreign dentists** have the opportunity to achieve an important academic title of international degree.

The teaching program involves 1,500 total hours (750 hours / year).

Part of them are dedicated to courses and the other part to will be divided in the following activities:

- Workshops
- Laboratory hours
- Internships
- Writing projects
- Activities of individual study

The master program ends with a **Master's thesis**, which takes place in the second year. Modules involve conventional versus laser treatments for different areas of dentistry: limits, advantages and disadvantages.

1. Enrolment period: 8 - 12 September 2014

2. Master venue: "Victor Babeș" University of Medicine and Pharmacy,
Eftimie Murgu Square, nr. 2A , Timisoara
Department of Master's Degrees, room 47

3. Number of participants: 10

4. Enrolment fee: 3000€ per year

5. Master duration: 2 years

6. Number of credits: 60/year (120 in total)

An additional administrative fee is added to the initial price, no more than **300 lei**

7. The admittance contest consists of:

Interview with each candidate.

There will be tested:

- a. Motivation for this master studies program choice, based on subsequent concerns in the field (egg. license papers, doctoral dissertation in a similar field),
- b. Linguistic communication competence (English), on a scientific theme proposed by the candidate (egg. from the candidate's license thesis or the doctoral dissertation).

8. Terms for contest registration: To the master admittance contest can register – Romanian and foreign citizens, graduates with a license diploma or it's correspondent, regardless of the number of years of study, institute and year in which the candidate obtained the license diploma or it's correspondent.

9. Interview date: 22nd of September 2014

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EMDOLA project directors:

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MODULES

- I: *Optics***
- II: *Physics of lasers***
- III: *Interaction laser-tissues***
- IV: *Laser Safety and Properties of lasers***
- V: *Lasers conservative dentistry and Laser in caries prevention***
- VI: *Lasers and endodontics***
- VII: *Laser in Oral Surgery; Periodontics and Implantology***
- VIII: *Low-Level Laser Therapy; Jurisprudence and Practice Management***
- IX: *Master Thesis (research in labs; redaction of paper to publish, MT defense)***
- X: *Clinical training (University hospitals)***

DETAILED INFORMATION ABOUT THE MODULES

EMDOLA Education Program: First Year Details

Module I Optics	History of lasers: -Laser history, lasers in medicine, -Lasers in dentistry, lasers in science, ...
	Optics data : - Introduction - Origins - Optics in the 17th, 18th, 19th centuries and today - Geometrical optics - The field concept - Mathematical formulation of the electromagnetic phenomenon - Diffraction, reflection, interference
	The quantum nature of the light: - Black bodies radiation - The light wave/particle dualism - The photoelectric effect - Absorption and emission
	Medical statistics Scientific literature SAS workshop Statistical methods E-Learning
Module II Physics of lasers	the Fabry-Perot interferometer
	Laser: - The light amplifying - Physical properties of lasers - Ultra-short pulses production
	Dosimetry: - Irradiation parameters - Emission mode profiles
Module III Interaction laser-tissues	Interaction laser-tissues in a physical point of vue: - Optical properties of biologic tissues - Light absorption in water - Light absorption in hydroxyapatite - Linear and non-linear interaction
	Processes: - Coagulation, vaporization, ablation, disruption, etc.

	<p>Interaction laser-tissues in a biological point of vue:</p> <ul style="list-style-type: none"> - Ablation, disruption, etc. - Light absorption in hydroxyapatite - Light absorption in melanin, hemoglobin, proteins, etc. - Thermal side effects - Influence of some parameters on the laser efficiency
<p style="text-align: center;">Module IV Laser Safety and Properties of lasers and their applications in dentistry</p>	<p>Laser safety and law requirements</p>
	<p>Laser handling:</p> <ul style="list-style-type: none"> - Light guidance principles - Transmission systems and their diversity
	<p>Construction, function, properties of laser systems in dentistry and their clinical applications:</p> <ul style="list-style-type: none"> - Er-YAG and ErCr:YSGG lasers (2940 and 2780 nm) - Nd-YAG laser (1064 nm) - Ho-YAG laser (2100 nm) - Nd-YAP laser - Alexandrite laser (755 nm) - He-Ne laser (632 nm) - Argon-ion laser (488 and 514 nm) - CO2 laser (9600 and 10600 nm) - Diode lasers (808 and 980 nm)
<p style="text-align: center;">Module V Lasers conservative dentistry and Laser in caries prevention</p>	<p>Lasers, caries diagnosis and prevention:</p> <ul style="list-style-type: none"> - General aspects of caries diagnosis and prevention - State of the research - Laser, enamel, dentine and fluoride - Laser fluorescence, laser spectroscopy - How to choose the adapted wavelength
	<p>Laser, cavity preparations, carious treatments:</p> <ul style="list-style-type: none"> - General aspects and state of the art in the field of cavity preparations - Enamel preparations, dentine preparations - Adhesion to enamel and dentine
	<p>Pulp capping:</p> <ul style="list-style-type: none"> - Treatment modalities - How to choose the adapted wavelength
	<p>Lasers in dental laboratories Laser bleaching PAD (Photo Activated disinfection)</p>
<p style="text-align: center;">Module VI Lasers and endodontics</p>	<ul style="list-style-type: none"> - General principles and state of the art on endodontic treatments - Endodontic microbiology and lasers - Laser and smear layer - Laser, root canal filling, root canal re-treatment - How to choose the adapted wavelength

<p align="center">Module VII Laser in Oral Surgery and Periodontics and Implantology</p>	<p>Lasers and periodontics:</p> <ul style="list-style-type: none"> - General aspects and state of the art in periodontology (Diagnosis, treatments) - Periodontal microbiology - Lasers and periodontal treatments (soft tissues, hard tissues [cement, bone defects]) - Indications, contra indications - How to choose the adapted wavelength
	<p>Lasers, oral pathology, oral surgery:</p> <ul style="list-style-type: none"> - General aspects and state of the art (soft tissues, hard tissues) - Indications, contra indications on the use of lasers in oral surgery - How to choose the adapted wavelength
<p align="center">Module VIII Low-Level Laser Therapy and Jurisprudence and Practice Management</p>	<p>Low-level laser therapy:</p> <ul style="list-style-type: none"> - Biological response - Diagnosis with non thermal laser - Indications, contra indications - Laser analgesia - Laser acupuncture
	<p>Jurisprudence Ethical considerations Methodology of medical scientific research Practice and marketing management</p>

<u>EMDOLA Education Program: Second Year Details</u>	
<p align="center">Module IX Master thesis</p>	<p>Draw up of the master thesis Guideline analysis and discussion Literature research, selection and analysis Rules to be followed in a laboratory Research work Evaluation criteria Analysis Conclusion Presentation of the MT MT defense</p>
<p align="center">Module X Clinical training</p>	<p>Clinical training on patients Students must present six to ten clinical observations in different fields of oral lasers applications. Discussion is based on the clinical cases, the quality of the documents, the treatment plan the methodology followed and the follow-up</p>