

EMDOLA Education Program

- Module 1: Optics
- Module 2: Physics of lasers
- Module 3: Interaction laser-tissues
- Module 4: Laser Safety and Properties of lasers
- Module 5: Lasers conservative dentistry and Laser in caries prevention
- Module 6: Lasers and endodontics
- Module 7: Laser in Oral Surgery ; Periodontics and Implantology
- Module 8: Low-Level Laser Therapy ; Jurisprudence and Practice Management
- Module 9 : Master Thesis (research in labs; redaction of paper to publish, MT defense)
- Module 10: Clinical training (University hospitals)

EMDOLA Education Program: First Year Details

1 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

2	Physics of lasers	<p>the Fabry-Perot interferometer</p> <p>Laser:</p> <ul style="list-style-type: none"> - The light amplifying - Physical properties of lasers - Ultra-short pulses production <p>Dosimetry:</p> <ul style="list-style-type: none"> - Irradiation parameters - Emission mode profiles
3	Interaction laser-tissues	<p>Interaction laser-tissues in a physical point of vue:</p> <ul style="list-style-type: none"> - Optical properties of biologic tissues - Light absorption in water - Light absorption in hydroxyapatite - Linear and non-linear interaction <p>Processes:</p> <ul style="list-style-type: none"> - 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
4	Laser Safety and Properties of lasers and their applications in dentistry	<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)

		<ul style="list-style-type: none"> - 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)
5	Lasers conservative dentistry and Laser in caries prevention	<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, dentin preparations - Adhesion to ... <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>
6	Lasers and endodontics	<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
7	Laser in Oral Surgery and Periodontics and Implantology	<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])

		<ul style="list-style-type: none"> - 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
8	Low-Level Laser Therapy and Jurisprudence and Practice Management	<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 Ethics Practice management Practice marketing</p>

<u>EMDOLA Education Program: Second Year Details</u>		
9	Master Thesis	<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>
10	Clinical training	<p>Clinical training on patients</p> <p>Students must present six to ten clinical observations in different fields of oral lasers applications.</p> <p>Discussion is based on the clinical cases, the quality of the documents, the treatment plan the methodology followed and the follow-up</p>

