



Quick facts:

- 5 semesters (2.5 years)
- Blended learning concept
- 120 ECTS
- Course language: English

Module plan „Lasers in Dentistry“

Semester 1

- **Laser Safety**
1 CP
 - Basics of lasers, laser hazards, protective measures
 - Participants qualify as dental laser safety officers
- **Erbium lasers**
5 CP
 - Physical and technical properties of Er:YAG and Er,Cr:YSGG lasers
 - Introduction and demonstration of erbium lasers, application of erbium lasers in dentistry
 - Discussion of laser-tissue interactions for these wavelenaths
- **Diode lasers & aPDT**
4 CP
 - Physical and technical properties of semiconductor lasers
- **Optics**
5 CP
 - Fundamentals of optics, physics of light
 - Properties of light, geometric optic, waves and light waves, photons.
- **PBMT & Statistics 1**
4 CP
 - Technical principals and the dental application of low power diode lasers
 - Medical statistics 1 for the interpretation of preclinical and clinical results
- **Scientific integrity 1**
1 CP
 - Scientific conduct
 - Literature research

Semester 2

- **Applied optics 1**
1 CP
 - Advanced understanding of optics using geometric optics
- **Laser physics**
6 CP
 - Key subject of lasers
 - Resonators, active media, pulsing, realistic description of laser beams
- **CO₂ lasers**
6 CP
 - Technical principles of CO₂ lasers
 - Introduction and demonstration of CO₂ lasers, application of CO₂ lasers in dentistry
- **Scientific integrity 2**
1 CP
 - Citations and plagiarism
 - Ethics
- **Treatments (own office)**
3 CP
 - Patient treatments in own dental office
 - Participants keep a treatment log
- **Case documentations**
6 CP
 - Treatment cases from module „Treatments (own office) are to be documented according to guidelines.
- **Case conference**
4 CP
 - Participants meet online in conference to discuss, interpret and establish treatment plans for their patients
 - Guidance for treatment planning is given by faculty

Semester 3

- **Applied optics 2**
1 CP
 - Advanced understanding of optics using wave optics
- **Pediatric dentistry**
2 CP
 - Participants learn laser-based treatment concepts for children
- **Applied laser physics**
1 CP
 - Advanced understanding of laser technique
- **Orthodontics**
2 CP
 - Introduction to the use of lasers in orthodontics
 - Tooth movement, bracket bonding and debonding
- **Nd:YAG lasers**
3 CP
 - Physical and technical properties of Nd:YAG lasers
 - Introduction and demonstration of neodymium lasers, application of neodymium lasers in dentistry
 - Discussion of laser-tissue interactions for these wavelengths
- **Treatments (excursion)**
2 CP
 - Participants visit our partner university MISR International University in Cairo, Egypt
 - Patient treatment with different dental laser systems under supervision
 - Participants keep a treatment log
- **Treatments (own office)**
3 CP
 - Patient treatments in own dental office
 - Participants keep a treatment log
- **Case documentations**
7 CP
 - Treatment cases from module „Treatments (own office) are to be documented according to guidelines.
- **Case conference**
2 CP
 - Participants meet online in conference to discuss, interpret and establish treatment plans for their patients
 - Guidance for treatment planning is given by faculty

Semester 4

- **Applied optics 3**
1 CP
 - Advanced understanding of optics using quantum optics
- **Symposium & Marketing**
3 CP
 - Participants present a preliminary version of their master thesis on a symposium
 - Marketing, practice management and staff management
- **Scientific integrity 3**
1 CP
 - Medical statistics 2 for planing and execution of statistics in the master thesis
 - Help and guidance in the writing and structuring of the master thesis
- **Treatments (own office)**
3 CP
 - Patient treatments in own dental office
 - Participants keep a treatment log
- **Case documentations**
3 CP
 - Treatment cases from module „Treatments (own office) are to be documented according to guidelines.
- **Case conference**
1 CP
 - Participants meet online in conference to discuss, interpret and establish treatment plans for their patients
 - Guidance for treatment planning is given by faculty
- **Master thesis**
14 CP
 - The master thesis is started in the 4th semester.
 - Work in own practice, labs, library, etc.

Semester 5

- **Treatments (own office)**
3 CP
 - Patient treatments in own dental office
 - Participants keep a treatment log
- **Case documentations**
4 CP
 - Treatment cases from module „Treatments (own office) are to be documented according to guidelines.
- **Case conference**
1 CP
 - Participants meet online in conference to discuss, interpret and establish treatment plans for their patients
 - Guidance for treatment planning is given by faculty
- **Master thesis**
16 CP
 - The master thesis is concluded in the 5th semester.
 - Work in own practice, labs, library, etc.
 - Statistical evaluation, writing of the thesis
- **Final exams**
 - Defence of 20 clinical case documentations from the treatment log of the participants
 - Defence of the master thesis