

## **Joint Degree Master Program: Implantology and Dental Surgery (M.Sc.)**

### **Specialized Modules: List of individual modules**

#### **Specialized Module 1**

##### **Basic principles of implantology**

The module comprises the following training contents:

- **dental implants**  
modes of implantation and loading  
implant types
  
- **diagnosis and planning**  
first consultation and pre-implantological diagnosis  
number of implants required  
general pre-implantological diagnosis  
special pre-implantological planning – single missing tooth  
temporary prosthodontic restoration of the single tooth space  
partially edentulous jaw  
edentulous jaw
  
- **Implant prosthodontics**  
biomechanical considerations  
anchor and connective elements
  
- **general operation principles**  
preparation and incision  
individual implantation steps  
healing period  
introduction to augmentation

- **materials for bone substitution and augmentation**  
introduction and terminology  
alloplastic bone implants and bone-substitution materials  
platelet-rich plasma
- **bone harvesting and processing**  
basics  
donor site: head-neck area  
donor sites outside head-neck region  
microvascularly anastomosed bone transplants
- **augmentation and onlay grafting**  
secondary implantation following bone augmentation  
total alveolar ridge augmentation
- **principles of displacement and condensation**  
sinus lift  
condensation techniques  
nerve lateralization
- **distractions osteogenesis**  
distraction osteogenesis of the alveolar process
- **GBR**  
guided bone regeneration  
implantation with simultaneous local bone augmentation
- **soft-tissue management**  
introduction  
soft-tissue augmentation  
pre-prosthetic surgery  
surgical exposure
- **prophylaxis and recall**  
individual oral hygiene, performed by the patient  
check-up parameters  
professional cleaning of titanium implants
- documentation and forensic aspects

Special seminars and practical training with renowned speakers presenting the most important implant systems and their special surgical and prosthetic features as well as special surgical drilling machines inclusive of computer-controlled ones.

The prosthodontic workshop includes the following topics:

- crowns
- bridges, bar-retained dentures, hybrid dentures
- maxillofacial prosthetic treatment with implants
- evidence-based principles in implant prosthodontic planning
- integration of implant prosthodontics in daily practice
- impact of implant position on the scaffold design in the crown-bridge technique
- principles of prosthodontic-technical planning of implant-retained restorations: from diagnosis to drilling template
- hybrid prosthetics
- hybrid prosthetics from technical/prosthetic view with special consideration of connective elements
- crown-bridge prosthetics: possibilities and limitations
- anatomical limitations: the problem of intermaxillary relationship
- implant-retained single crowns in the esthetically relevant region

Moreover, this module features:

- emergency measures
- practice structure for execution of surgical interventions
- dental assistance
- X-ray technology and X-ray protection
- modern dental systems
- business administration
- cost estimation and financial accounting
- forensic aspects, malpractice, complications
- Polyclinic for oral surgery – what kind of problems may occur?
- surgery: initial phase
- Journal Club
- basics in biomineralisation
- clinical relevance of latest research results
- QM in implantology
- EBM – evaluation of studies: features of clinical trial, review, etc.
- Medline research, medical databases on the Internet

## Specialized Module 2

### Special topics in implantology

The module comprises the following training contents:

#### **implantation in cases of extreme atrophy of the alveolar ridge**

##### **augmentations in the mandible**

- extreme atrophy of mandible and maxilla

##### **augmentations in the maxilla**

#### **implantation in class III relationships**

- correction of sagittal discrepancy by maxillary ridge augmentation using iliac crest graft and secondary implantation
- Le Fort I osteotomy with simultaneous implantation
- Le Fort I osteotomy with simultaneous sinus lift
- correction of sagittal discrepancy by implantation and denture with subsequent mandibular setback operation using Obwegeser/Dalpont osteotomy
- mandibular setback operation using Obwegeser/Dalpont osteotomy and simultaneous implantation in the maxilla and mandible
- mandibular setback operation and simultaneous implantation in the mandible
- mandibular setback operation and simultaneous implantation in the maxilla

#### **implantation following trauma**

- grade 3: condition after Le Fort I fracture of the maxilla
- grade 4: condition after comminuted mandibular fracture
- grade 4: condition after comminuted maxillary fracture

#### **options and problems of implantation treatment for tumor patients**

- mandibular resection with simultaneous implantation in the maxilla and the mandible
- partial mandibular resection and secondary implantation
- maxillary resection and secondary implantation
- mandibular resection and secondary implantation in the local bone
- mandibular resection and secondary implantation in the free transplanted bone
- mandibular resection and secondary implantation in a micro-vascular pedicled graft
- maxillary resection with simultaneous implantation
- mandibular resection and secondary implantation in the transplanted bone
- maxillary resection, bone and soft-tissue reconstruction, and secondary implantation into a free transplanted bone
- mandibular resection, soft-tissue reconstruction and secondary implantation (1)

- mandibular resection, soft-tissue reconstruction and secondary implantation (2)
- mandibular alveolar crest resection and secondary implantation

### **Implantation in the case of congenital deformities**

- the significance of musculature in jaw and nose development
- complete revision of an incompletely operated cleft lip, alveolus and palate
- combination of alveolar bone grafting and implantation
- implantation with condition after insufficient primary operation
- primary operation according to the Muenster concept and implantation
- elderly cleft patient with several operations
- elderly cleft patient with several operations and pronounced maxillary atrophy and maxillary retrusion
- re-operation of lip, nose, alveolus, and palate closure
- bilateral sinus lift and simultaneous implantation (1)
- bilateral sinus lift and simultaneous implantation (2)
- bilateral sinus lift and simultaneous implantation (3)
- implantation following extension plasty in patients with ectodermal dysplasia
- implantation and sinus lift in patients with ectodermal dysplasia
- Hanhart's syndrome
- implantat-fixed ear epithesis with Goldenhar's syndrome

### **osseointegration – situation analysis**

- anchoring processes of a cell (ILI cell culture)

### **tissue engineering I – biological and biophysical principles of bone regeneration**

### **tissue engineering II – the significance of angiogenesis for jaw bone regeneration**

### **Surgical training using human cadavers**

- incision and nerve visualization
- implantation, step-by-step and alternative planning options and splint fabrication
- soft-tissue management
- augmentation techniques
- dissecting training
- dissecting training, surgical techniques
- demonstrations with practical training
- demonstration of different implant systems
- navigation systems

Training includes:

- basic surgical principles
- anatomy, soft tissues, bone, nerves, blood vessels, etc.
- incisions
- bone dissection

- harvesting of bone
- sinus lift
- nerve visualization and displacement
- soft-tissue management

## Specialized Module 3

### Clinical training

**A. clinical training 1: Observation of implantation**

**B. clinical training 2: Dentoalveolar surgery**

**C. clinical training 3: Implant surgery**

The module comprises the following training contents:

#### Observation

- live surgery
- planning of implant treatment with regard to function and esthetics
- principles of soft tissue management: incisions, blood supply, flap design, flap formation, sutures
- soft tissue surgery in implantology: vestibuloplasty, exposure techniques
- bone grafts – principles and pathophysiology
- basics of augmentative procedures
- bony-lid approach in implantat surgery
- intraoral bone harvesting: instruments, bone grafts from the retromolar area, chin grafts
- augmentation techniques with limitations: bone spreading, bone splitting, bone expanding, bone condensing, extension plasty
- bone-substitute materials
- hands-on training on animal bones: vestibuloplasty, suture techniques, bone harvesting using microsaw, implantation with the XIVE system

#### Surgery

- basic principles of surgery
- assistance and performance of uncomplicated surgery in the OR
- working in the ward, IV injection, infusions, intensive care
- participation in surgical treatment or risk patients, management of risk patients
- emergence measures
- participation in special consulting session for patients seeking dental implant treatment
- planning of dental implant treatment
- cost estimation
- patient consent and legal problems

- implant template manufacturing
- implant placement and soft tissue surgery
- implant placement after trauma, tumor, malformation, atrophy
- bone harvesting
- orthodontic indications and possibilities
- oral rehabilitation after tumor, trauma, malformation, atrophy
- cases (planning)

## **Specialized Module 4**

### **Master thesis**

The master thesis is a scientific paper taking into consideration the relevant literature.