**OPTIONAL DISCIPLINES - OFFER**

**UNIVERSITY YEAR 2020-2021**

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| ***Item-uri*** | ***Cerinţe*** |
| **Lecture title** | Classic versus Minimally Invasive and Robotic Assisted Orthopaedic Surgery |
| **Objectives** | Practical approach and actual trends regarding biological implant application by minimally invasive and robotic assisted orthopaedic surgery.  |
| **Aim group** | 4th year. |
| **Participants** | 30-40 |
| **Topics** | 1. Lecture: Absolute stability: plates and screws. Open reduction and internal fixation: disadvantages and limits. Workshop: Preoperative planning. Lag screw principles; plating of the diaphyseal femoral fractures - simulations on plastic bones2. Lecture: Relative stability – intramedullary nailing of the long bones. Workshop: intramedullary nailing of the tibia, antegrade and retrograde intramedullary nailing of the femur - simulations on plastic bones3. Lecture: Minimally invasive plate osteosynthesis (MIPO) – concepts, definition, surgical techniques, evolution of plate design, intraoperative control techniques for axis, rotation and length control for the inferior limb. Specific tools for MIPO. Workshop: percutaneous plate fixation of the distal tibia in a multifragmentary fracture. MIPO by anterior approach with classic plates in complex fractures of the humeral diaphysis - simulations on plastic bones4. Lecture: Internal fixator principles – plates with monoaxial angular stability type Less Invasive Stabilization System (LISS) or Locked Compression Plates (LCP). Workshop: Stabilization of proximal tibial fractures with the LISS or LCP. MIPO with LISS or LCP in a complex fracture of the distal femur - simulations on plastic bones using targeting devices.5. Lecture: New trends in angular stable implants osteosynthesis: Biomechanics and clinical application of anatomically preshaped locking plates. Advantages of poliaxial plate stability in minimally invasive plate osteosynthesis. Polyxial plates versus XS-nails for fractures of distal fibula or distal radius.  |
|  | Workshop: MIPO with a plate with polyaxial stability in a complex fracture (C3/AO) of the distal femur. Internal fixation of a proximal humeral fracture and distal radius fracture using titanium plates with polyaxial stability - simulations on plastic bones.6. Lecture: Biology of callus formation and remodeling. Periimplant tissue reactivity for implant materials. Workshop: metallic implant biocompatibility testing in vivo (rat model).7. Lecture: Biomechanical testing of the bone-internal fixator assembly on a testing machine.Arthroplasty of the hip: principles, approaches, prosthesis types, operative techniques. Arthroplasty of the knee: principles, approaches, prosthesis types, operative techniques (classic, minimally invasive and robotic assisted by navigation system)Workshop: 3D photogrammetry software applications for resolving the rigidity of the synthetic femur – implant construct. Total arthroplasty of the hip – simulation on plastic bones, total arthroplasty of the knee (classic and robotic assisted) – simulation on plastic bones and computer assisted interactive multimedia simulation. |
| **Bibliography** | 1. Paul Dan Sîrbu, Nikolaus Schwarz, Wlliam Dias Belangero, Bruno Livani, Margrit List, Paul Botez, Robert Ioan Mihăilă, Minimally invasive plate osteosynthesis in long bone fractures (CD included). Casa de editura Venus, Iasi 2008, ISBN 978-973-756-083-42. Wagner M, Buckley R, Internal fixators, Concepts and Cases using LCP and LISS, 2006, Thieme Publishing CD included, ISBN: 97831314355143. G. O. Tong and S. Bavonratanavech, Minimally Invasive Plate Osteosynthesis (MIPO): concepts and cases presented by AO East Asia: New York: Thieme, 2006. CD Included ISBN: 3-13-143391-44. Canale ST, Beaty JH, Campbell's Operative Orthopaedics: 4-Volume Set with DVD, Mosby; 11 edition, 2007, ISBN-10: 0323033296  |
| **Competences (abilities acquired)** | Ability to perform fracture osteosynthesis (intramedullary or extramedullary) on plastic bones by using preoperative planning, indirect reduction techniques, classic and minimally invasive procedures, classic and biological implants.Ability to conceive and perform a biomechanical study or an experimental research on animal model. Ability to perform arthroplasty of the hip and of the knee on plastic bones, using classical techniques and assisted robotic navigation systems. |
| **Teaching methods and lecture notes** | 1. Lectures: Multimedia presentations and pdf electronic support for the participants. Books with demonstrative CDs in references. CDs with educational software.2. Workshop: 5 work tables, synthetic bones, instruments and implants for classic and minimal invasive procedures, plates with angular stability and aiming devices for percutaneous insertion and internal fixation, intraoperative live demonstration with broadcasting, Photo Modeller software applications |
| **Responsable** | Associate Prof. Dr. Paul Dan Sîrbu  |
| **Associated lecturer** | Associate prof. Dr. Paul Dan Sîrbu (UMF Iasi), Prof. Dr. Carmen Elena Cotrutz (UMF Iaşi), Prof. Dr. Eugen Carata (Technical University Iasi), lecturer: Dr. Puha Bogdan (UMF Iasi), table instructors: Dr Paul Dan Sîrbu, Dr. Puha Bogdan, Dr. Popescu Dragos, Dr. Bodescu Adrian, Dr. Radu Valentin, Dr. Veringa Vlad |
| **Keywords** | Minimally invasive plate osteosynthesis, plates with angular stability, robotic assisted orthopaedic surgery  |