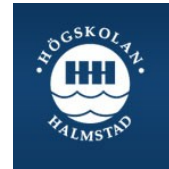




Swedish Research School in Tribology

Research school course plan

Title:	<i>Biotribology and Biolubrication</i>
Points:	4 hp
Time:	10th -13th May 2011
Objectives:	After completing this course, students should understand the following fundamental aspects: <ul style="list-style-type: none">• Synovial joints• Biolubrication, wear and friction with non-Newtonian lubricants• The characteristics of human bone and cartilage• Requirements for stress bearing implants material• Wear particle characterisation• Bio-tribo-corrosion• Total disk replacement and the biomechanics of the spine• Functional surfaces and surface characterisation (dental implants)• General orthopaedics of bio-tribology
Contents:	<ol style="list-style-type: none">1. Introduction to Biotribology2. Overview “materials and their application in medical devices” (focus on materials in load bearings implants)3. UHMWPE (mechanical properties, composite based UHMWPE, sterilization. Update on the latest research on UHMWPE)4. Metal on Metal and Bio-tribo-corrosion5. Wear particles characterisation6. Fluid: "Human joint lubricant", Tribology of synovial joints7. Structure and mechanical properties of bone and cartilage8. Orthopaedic overview and procedures, what happens in reality *Observation of a hip/knee surgery9. Biomechanics of the human spine10. surface characterisation & functional surfaces (dental implants)11. PMMA (cemented and un-cemented implants)
Teaching:	Lectures and group-work
Prerequisites:	Basic knowledge in material science, chemistry and mechanical engineering. Basic knowledge in biology and anatomy are useful.
Examination:	Reports and group-work presentation
Grading:	Pass or Fail
Examiner:	Associate Professor Nazanin Emami Luleå University of Technology,



Swedish Research School in Tribology

Division of Machine Elements

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Literature:

Hand outs and presentation slides.

Invited teachers:

Professor B-G Rosen (surface characterisation and functional surfaces)

Dr. I. Hussainova (synovial joint and biolubrication)

Dr. J. Tipper (wear particles characterisation)

Dr. X. Hu (biotribocorrosion)

Dr. P. Marques (cemented and un-cemented implants, PMMA)

Dr. C. Persson (TD Rand biomechanics of spine)

Professor K-G Nilsson (orthopaedic overview)

Värmt välkomna!