

Orthopaedic Biomechanics: Implants and Biomaterials

Overview

Biomechanics is a subject that seeks to understand the mechanics of living system; it is mechanics applied to biological system. Biomechanics helps us to understand the relationship between structure and function, predict changes due to alterations, and propose methods of artificial interventions. Thus diagnosis, surgery and prosthesis are closely associated with Biomechanics. A most vigorous development of Biomechanics is associated with Orthopaedics, because the most frequent users of the surgical theatres are patients with musculoskeletal problems. The Biomechanics of trauma, injury and rehabilitation is becoming increasingly important to modern society. Fundamental research has included not only surgery, prosthesis, implantable materials and artificial limbs, but also cellular and molecular aspects of healing in relation to stress and strain, and tissue engineering of cartilage, tendon and bone. Lectures will be delivered by internationally renowned faculties from abroad and India. This course will cover the fundamental aspects as well as state-of-the-art techniques of modelling and simulation and is intended towards engineers, scientists and clinicians.

| | |
|-------------------------------------|---|
| Modules, Dates, Participants | <p>Clinical Problems in Orthopaedics, Musculoskeletal system, Basic concepts of Biomechanics, Gait Analysis & Joint Kinematics, Imaging Techniques & Biomechanical Analysis, Biomechanics of Total Joint Replacement – Hip, Knee, Shoulder, Elbow. Biomaterials and Biomaterial behavior, Basic Concepts of Implant Design, Failure Mechanisms and Current Concepts.</p> <p>Duration: Ten working days; November 30 – December 11, 2015.</p> <p>Number of participants for the course will be limited to fifty.</p> |
| You Should Attend If... | <p>This course is designed for B.Tech / M.Tech / PhD students of Mechanical, Civil, Biomedical Engineering and Medical students (with special interest), who are likely to be benefited by learning the fundamental aspects of modelling and simulation of musculoskeletal system. Faculty members and Research Associates are also welcome. This is an excellent opportunity for the participants to learn details of modelling and analysis of bone and implant, Biomaterials and Biomaterial behavior, in order to pursue advanced studies and research in areas related to Biomechanics and Biomaterials.</p> |
| Fees | <p>The participation fees for taking the course is as follows:</p> <p>Participants from abroad : US \$500</p> <p>Industry/ Research Organizations: INR 30000</p> <p>Academic Institutions: INR 10000</p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hour free internet facility. The participants will be provided with accommodation on payment basis.</p> |

The Faculty



Professor Nico Verdonschot is in the faculty of the Radboud University Medical Center Nijmegen and the University of Twente both situated in The Netherlands. His research interests include computer modeling of failure processes of orthopaedic implants and musculoskeletal modeling of the lower limb.



Dr. Joydeep Banerjee Chowdhury is a renowned Orthopaedic Surgeon presently working as Head of the Department of Orthopaedics in AMRI Hospital, Salt Lake, Kolkata. He has practiced extensively in India and United Kingdom. Dr. Banerjee Chowdhury specializes in Joint Replacement Surgery and Trauma Surgery.



Dr. Prasanta Kumar Saha is an eminent Orthopaedic Surgeon, currently working as an Assistant Professor in the Department of Orthopaedics, Institute of Post Graduate Medical Education and Research (IPGMER) and SSKM Hospital, Kolkata. Dr. Saha specializes in Hip Joint Replacement Surgery and Arthroscopy.



Professor Amit Roy Chowdhury is a faculty member in the Department of Aerospace Engineering and Applied Mechanics of Indian Institute of Engineering Science and Technology Shibpur. His research areas include Implant Biomechanics, Biomaterials and Finite Element Analysis. He was a visiting faculty to the State University of New York (SUNY).



Dr. Santanu Dhara is currently working as an Associate Professor in the School of Medical Science and Technology, Indian Institute of Technology Kharagpur. He has established Biomaterials and Tissue Engineering (BMTE) Laboratory in the School with the vision of product development research based on fundamental understanding of cell-material interaction. The BMTE group is working for the development of customized implants through various top down and bottom up fabrication strategies.



Professor Sanjay Gupta is presently working in the Department of Mechanical Engineering, Indian Institute of Technology Kharagpur. He has developed Biomechanics laboratory in the department and has successfully collaborated with University of Southampton, United Kingdom. His primary research areas are bone and joint mechanics, pre-clinical analysis of implant design and tissue engineering.

Course Co-ordinators

Prof. Sanjay Gupta

Principal Co-ordinator

Phone: +91-(0)3222-282958

E-mail: sangupta@mech.iitkgp.ernet.in

Dr. Santanu Dhara

Co-Coordinator

Phone: +91-(0)3222-282306

E-mail: sdhara@smst.iitkgp.ernet.in

.....
<http://www.gian.iitkgp.ac.in/GREGN>