

Pediatric Biomechanics – Deformities, Treatment and Injury Prevention

Overview

The course addresses the following topics:

Pediatric trauma and orthopedic conditions significantly affect the quality of life in children. While pediatric skeletal deformities causes significant chronic problems associated with growth restriction, breathing difficulties, degenerative spine disease and pain; motor vehicle crashes are the leading cause of death for children ages four years and older, with more than 5000 deaths per year for ages 21 years and younger. This course would provide a comprehensive overview critical for deformity treatment and automotive safety considerations: Pediatric anatomy, skeletal deformities, pediatric medical device development and surgical treatment, as well as pediatric injury tolerance and biomechanics, occupant protection, testing and federal regulation. The knowledge gained from this course will enable students to be more aware of the pediatric anatomy, deformities and injury tolerances, as well as challenges associated with pediatric medical device development and injury prevention.

The objectives of the course are:

1. Familiarity with bony landmarks, anatomical terminology and structures of the different body regions.
2. Gain knowledge about the etiology, diagnosis and treatment of pediatric spine and rib cage deformities.
3. Understand the pediatric medical device development process, testing and regulatory pathway.
4. An understanding of the pediatric biomechanics of the different body regions, associated injury mechanisms and tolerance.
5. Recognize the significance of various injuries, how to rank order and quantitatively compare their severity, and how to assess overall severity of multiple injuries
6. Identify the biomechanical and legal basis of automotive safety regulations.
7. Describe the different measuring capabilities of various pediatric crash test dummies including Hybrid III and Q-series crash test dummies.

Course participants will learn these topics through lectures and hands-on exercise problems. Also, case studies and assignments will be shared to stimulate research motivation of participants.

Course Dates	March 20th – 24th, 2017
Host Institute	IIT Madras
No. of Credits	1
No. of Participants	30-40
You Should Attend If...	<ul style="list-style-type: none"> • The course is open to students and faculty members with back ground in Biomedical engineering, Mechanical, Applied Mechanics, Engineering Design
Course Registration Fees	<p>The participation fees for the course is as follows:</p> <p>Student participant: Rs.1000 Government Organizations: Rs.5000</p> <p>Faculty Participants: Rs.3000 Industry Participants: Rs.10000</p> <p>The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges.</p> <p>Mode of payment: Demand draft in favour of “Registrar, IIT Madras” payable at Chennai.</p>
Accommodation	<p>The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel</p>

Course Faculty



Dr. Sriram Balasubramanian, Ph.D. is an Associate Professor in the School of Biomedical Engineering, Science and Health Systems at Drexel University in Philadelphia, US. He is an Adjunct Senior Research Scientist at the Centre for Injury Research and Prevention at The Children’s Hospital of Philadelphia. He primarily focuses on developing methods and computational tools to study pediatric skeletal deformities and injuries.

Course Coordinator



Dr. S. Ramakrishnan, Ph.D. is a Professor and heads the laboratory of Non-Invasive Imaging and Diagnostics at the Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai. His research interests include enhancing the diagnostic relevance of medical equipment using models, measurements and machine learning, Calibrations of Medical Devices and regulation science.

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