MPhil/ PhD in Biomechanics

The Biomechanics team at Staffordshire University has an international reputation for research, scholarship, industrial consultancy and post graduate education. In addition to MPhil/ PhD courses, we offer several continuing professional development (CPD) workshops and training days in the areas of clinical, sport and exercise biomechanics and disciplines related to musculoskeletal sciences and rehabilitation. Led by Professor Nachiappan Chockalingam, the team has a substantial track record of scientific publications and collaborations with researchers across various countries. With continued expansion of these partnerships across the EU and beyond, the research within the team focuses on (1) biomechanics of the diabetic foot (2) evidence based musculo-skeletal clinical practice (3) footwear biomechanics (4) effective lower limb orthotic intervention and (5) aetiopathology of scoliosis.

Biomechanics of the Diabetic Foot

Our current work in this area involves experimental analyses along with numerical and mathematical modelling to integrate all aspects of diabetic foot and footwear including; clinical and biomechanical assessment and insole material choice for footwear prescription. The work by the group has also developed innovative methods of assessing musculo-skeletal tissue biomechanics (Nachiappan Chockalingam, Roozbeh Naemi, Pananagiotis Chatzistergos, Aoife Healy)

Example:
- Development of a new generation of DIABetic footwear using an integrated approach and SMART materials (DiaBSmart)

Evidence based musculo-skeletal clinical practice

Our current work seeks to improve our fundamental understanding of how the musculo-skeletal system functions during activities of daily living specifically during walking gait. This lab and clinic based work has involved a mixed methods approach using both quantitative and qualitative research methodologies. (Nachiappan Chockalingam, Roozbeh Naemi, Pananagiotis Chatzistergos, Aoife Healy, Helen Branthwaite, Alfred Gatt, Tony Ward, Anand Pandyan)

Examples:
- Advanced protocol development for human movement research that underpins clinical product development and evaluation.
- Falls assessment and identifying predictors for falls.
- Biomechanical investigation of passive ankle joint complex
- Assessment of functional kinematic and kinetic parameters in various treatment protocols in patients
- Development of an integrated system for monitoring balance training in Elderly (El-BET)
- Innovative quantification of coordination during gait and clinical implications

Footwear Biomechanics

Current research in this area focuses not only on design and technology but also on choice of footwear and how it affects human health. We are involved with evaluation of footwear for various commercial establishments. Our research aims at improving functionality and comfort for everyday
and prescription footwear. We also work on sports specific footwear and has been involved in the
development of innovative designs of running shoes. (Roozbeh Naemi, Nachiappan Chockalingam, ,
Pananagiotis Chatzistergos , Aoife Healy, Helen Branthwaite, Alfred Gatt, Cynthia Formosa)

Examples:
- Heelless running shoe to decrease the ground reaction impact shock during landing
- Kinetics and kinematics assessment of field hockey footwear.
- Footwear choice for Children and young adults and their implications for long term foot health.

**Effective lower limb orthotic intervention**

As evidenced by our numerous publications, we have conducted and continue to work on several
projects which contribute to a greater understanding of the form and function of foot orthoses and
how they affect foot and lower limb biomechanics. Our current work also includes a major study on
design and function of ankle- foot orthoses. (Nachiappan Chockalingam, Roozbeh Naemi, 
Pananagiotis Chatzistergos , Aoife Healy, Helen Branthwaite, Alfred Gatt, Stephen Osborne)

Examples:
- Functional evaluation of foot orthoses
- Biomechanical assessment of Redbacks unique shoe technology (RUST)

**Spinal Biomechanics/ Scoliosis**

This is another area of work where we have made some substantial contribution in understanding
the aetiopathology of spinal deformity and also on the surgical and conservative management. Our
current work in this area involves, Imaging modalities and Image processing along with protocol
development for kinematic assessment of the back and spine. (Pananagiotis Chatzistergos,
Nachiappan Chockalingam, Robert Needham, Thomas Shannon, EB Ahmed, Vinay Jasani, Tony
Ward)

Examples:
- Back Surface Topography in patients with Scoliosis
- 3D reconstruction of biplanar x-rays to assist in estimating the volume of thorax in patients
  with spinal deformities
- Functional evaluation of foot orthoses
- Biomechanical assessment of Redbacks unique shoe technology (RUST)

**Entry requirements**

A PhD entry normally requires a post graduate degree or in exceptional circumstances a good
honours degree in a relevant discipline area.
To comply with the UK Border Agency (UKBA) regulations introduced in 2011, all international students whose first language is not English must provide a recent, recognised, English language qualification.

For further details please visit: [http://www.staffs.ac.uk/international/how_to_apply/entry_requirements/index.jsp](http://www.staffs.ac.uk/international/how_to_apply/entry_requirements/index.jsp)

**Fees**

*2015/16 New Entrants, Part-time*

- Home and EU students: £2,000 per year of study
- International students: £5,625 per year of study

*2015/16 New Entrants, Full-time*

- Home and EU students: £4,000 per year of study
- International students: £11,250 per year of study

For further details and informal discussion, please contact:

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