

Advanced Materials in Sports Equipment

School of Metallurgy & Materials, School of Metallurgy and Materials

College of Engineering and Physical Sciences

Details

Code 17192

Level of study Third/Final year

Credit value 10

Semester 2

Module description

The module first describes impact behaviour and wave theory as it relates to energy transfer, losses and damping in sporting applications, using the racket and club sports as examples. The effects of stiffness on sporting performance using F1 and performance bicycles in addition to those illustrated above. The major classes of material used in sports equipment will be discussed (eg wood, rubbers, PMCs aluminium, steel, titanium) in respect to their moduli, vibration and damping characteristics along with the variations that can be achieved using alloying and processing techniques. Specific examples will be cited showing the development of the golf ball, golf club head and shafts; balls and rackets for squash and tennis; F1 chassis and engine development; Velodrome, road racing and mountain bike, bicycle frames. The use of commercial trajectory equipment will be used to investigate aerodynamic effects.