**Biomechanics**

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**Abstract:**

Biomechanics is the study of the structure and function of the mechanical aspects of biological systems, at any level from whole [organisms](https://en.wikipedia.org/wiki/Organism) to [organs](https://en.wikipedia.org/wiki/Organ_(anatomy)), [cells](https://en.wikipedia.org/wiki/Cell_(biology)) and [cell organelles](https://en.wikipedia.org/wiki/Cell_organelle), using the methods of [mechanics](https://en.wikipedia.org/wiki/Mechanics). It is closely related to [engineering](https://en.wikipedia.org/wiki/Engineering), because it often uses traditional engineering sciences to analyse [biological systems](https://en.wikipedia.org/wiki/Biological_systems). Some simple applications of [Newtonian mechanics](https://en.wikipedia.org/wiki/Classical_mechanics) or [materials sciences](https://en.wikipedia.org/wiki/Materials_science) can supply correct approximations to the mechanics of many [biological systems](https://en.wikipedia.org/wiki/Biological_systems). Applied mechanics most notably mechanical engineering disciplines such as continuum mechanics, mechanism analysis, structural analysis, kinematics and dynamics play an important role in study of Biomechanics. The study of this ranges from the inner workings of a cell to the movement and development of [limbs](https://en.wikipedia.org/wiki/Limb_(anatomy)), to the mechanical properties of [soft tissue](https://en.wikipedia.org/wiki/Soft_tissue) and [bones](https://en.wikipedia.org/wiki/Bone). Some simple examples of this research include the investigation of the forces that act on limbs, the [aerodynamics](https://en.wikipedia.org/wiki/Aerodynamics) of [bird](https://en.wikipedia.org/wiki/Bird_flight) and [insect](https://en.wikipedia.org/wiki/Insect) [flight](https://en.wikipedia.org/wiki/Flight), the [hydrodynamics](https://en.wikipedia.org/wiki/Hydrodynamics) of [swimming](https://en.wikipedia.org/wiki/Aquatic_locomotion) in [fish](https://en.wikipedia.org/wiki/Fish), and [locomotion](https://en.wikipedia.org/wiki/Animal_locomotion) in general across all forms of life, from individual cells to whole [organisms](https://en.wikipedia.org/wiki/Organism). With growing understanding of the physiological behaviour of living tissues, researchers are able to advance the field of [tissue engineering](https://en.wikipedia.org/wiki/Tissue_engineering), as well as develop improved treatments for a wide array of [pathologies](https://en.wikipedia.org/wiki/Pathology). It is also applied to studying human musculoskeletal systems. Such research utilizes force platforms to study human ground reaction forces and infrared videography to [capture](https://en.wikipedia.org/wiki/Motion_capture) the trajectories of markers attached to the human body to study human 3D motion. Biomechanics is widely used in orthopaedic industry to design orthopaedic implants for human joints, dental parts, external fixations and other medical purposes. Bio-tribology is a very important part of it. It is a study of the performance and function of biomaterials used for orthopaedic implants. It plays a vital role to improve the design and produce successful biomaterials for medical and clinical purposes. One such example is in tissue engineered cartilage.

**Key words:** Biomechanics, continuum mechanics, soft tissues, aerodynamics, bio-tribology.