

## Learning outcomes and module design

Hello and welcome to module one for the course Human Movement Science. Let's look at some of the learning outcomes and the modules that we'll be learning throughout the course. Human Movement Science, the way we've designed the course, is broken down into eight modules across your eight weeks. And the first module will be looking at introduction to human movement science. So, we'll understand the field, the area of study, what constitutes within the area of studies, some of the key subjects like biomechanics, kinesiology, functional anatomy, and some other areas of data sciences. So, the module two consists of human body.

So, we'll be looking at some of the key aspects in the human body, key systems that govern us to move, like the skeletal system, muscular-skeletal system, and the neuromuscular system. Module three, on the other hand, we'll be looking at function anatomy. So, now that we have understood what the human body consists of, comprises of, and what systems are responsible for movement, how exactly do they coordinate? what generates movement? What creates movement? And what exactly happens? In module four, we'll be looking at biomechanics, which is an area of study within itself for human movement science. So, we'll be looking at the key roles that biomechanics plays to understand human movement science and the principles within biomechanics.

Let's look at each of these modules individually and some of the learning, key learning outcomes that we will be addressing in each of these modules. So, as we spoke about introduction to human movement science, we'll be looking at the area of study, the broad field, and what governs human movement science. We'll be looking at the integrated fields within human movement science. We'll be looking at the significance and application. So, where all could you use the science that we study, the theories, the principles, the examples, how you can apply, for example, in sports, for healthcare and well-being.

So, we'll be looking at all of that. We'll also be looking at the professional skill set development. So, what skills would you develop from this course? What will it enable you to do? Where can you apply these, you know, and what are some of the other courses that you can then go on to pursue? Before we do all of that, we'll also be looking at the background knowledge that you require to study this course extensively. So, a little bit of prior learning, maybe in basic mathematics. We will also be providing you resources for all of these preparatory material that you might require for this course.

Let's do it again. So, we will be providing you resources as articles or books that you can read or some preparatory material in terms of, say, basic maths that you might require for this course, and that will contribute to you prepping for the course. We'll also be looking at some industry experts within the banner of human movement science. So, you'll be hearing a lot from coaches, you might hear from sports medicine professionals, you might also hear from some sports scientist or a biomechanist to understand how they use, and they see the view and the role of human movement science in their day-to-day professional lives. So, how would they employ the principles that we study? So, how they collaborate with each other to solve a common problem.

Module 2, we'll be looking at the human body, we'll be looking at the skeletal system, the muscular system and the nervous system. So, we'll be looking at how these systems are designed: the nature

of the bones, muscles, and the nerves that allow us to move. How do these systems come together for harmonious functioning to cause movement? So, we'll be looking at that as well. Briefly, also, we'll be getting into an area of study itself, which is motor control. So, motor control will allow us to understand where does learning happen for the movement, where does it originate, how do we learn? So, do we learn the skill first? You know, how do we go on to make it better and put our own little signature into it.

So, we'll be looking at all of that under motor control, and motor learning will also be looking at these motor skills or the motor areas in the brain, how do they coordinate to produce movement. Further moving on to Module 3, we'll be looking at functional anatomy. So, you'll be learning a lot of theory in this module, which is key to understanding movement. This is exactly where it starts with the human body understanding what an anatomical position is. So, what's our ground zero? What do we relate it back to the directions? So, speaking the common language between professionals, you need to understand how do we address directions and also understand the reference systems.

So, where is the movement occurring? How exactly can we define it? So that, you know, when you are defining it, and another professional is defining it, you are all on the same page. Hence, we require the reference systems. Then, we will be moving on to bones and joints and movement. So, what causes movement? How does movement occur anatomically? And the muscles and bones that come together, so how exactly does that happen? So, we'll be looking at posture analysis as well. What's a normal posture? What's altered? What causes a good and a bad posture, and how important it is for us to have a good posture? We'll also be looking at the implications of functional anatomy in human movement science.

So, now that we've looked at bones, muscles, how exactly we move, what causes movement, we'll be looking at how all of these things put together helps us understand human movement science. Module 4, we'll be diving into biomechanics for human movement science. So, biomechanics is an area of study in itself. We'll be going through the scope, the application, the significance. So, what's the potential of the entire field to study the movement? Within biomechanics, it will be divided into kinematics and kinetics.

What's the study within it, which is looking at the kinematic principles to study movement and then also looking at the kinetic principles. It has got to do with force, energy, work, for example, to study movement. So, from our first four modules, all the theoretical modules, you've learned biomechanics, kinesiology, functional anatomy, and how exactly movement occurs. From module 5, we will be looking at what tools, techniques, any technology that we can use to understand the movement occurring. So, module 6, we'll be looking at applications of human movement principles using these tools and the concepts that we've studied to fundamental movement skills that are absolutely essential for movement, which you can call as movement ABCs, and also a few common exercises.

And then we dive into specifically gait analysis. So, what is gait? How it's extremely crucial to have a good gait for an athlete as well as any kind of physical activity. Module 7, we look at applications of human movement science principles in sport. So, now that we've looked at all of these fundamental movements in exercise and gait, we go dive specifically into sports science aspect of it, which is applying all of these principles that we study to sporting skills. And in the last module, which is

module 8, we'll be looking at the integrated disciplines that we've looked in the introduction chapter or introduction module.

And we're looking at how these strengthen our scope and how we can collaborate to further enhance the state of art of human movement science. So, looking at module 5 in detail, we'll be looking at the different types of analysis, which is qualitative, quantitative tools and techniques within these analyses to study human movement. So, we'll also be looking at computer simulation, musculoskeletal modeling and EMG techniques as well to study movement. Module 6, we'll be diving into applications of human movement principles. So, we'll be looking at how do we apply all of these principles that we've studied in the previous modules to fundamental movements, to exercises, and to gait.

So, we will be looking, most importantly, from a coaching point of view. So, for the coaches, if there are any coaches in this courses or athletes, it's beneficial to you both or any other sports science professionals to understand what is the coaching view or what how does coaching science, for example, helps us understand the motor skills and how we can analyze these fundamental movements and the major exercise movements and gait and identify the key performance and the injury patterns that are within this movement so that we can enhance performance and prevent injuries. Module 7, we'll be looking at the same principles, but now applied to different sports. So, we'll be looking at how sport can be categorized differently according to the movement characteristics of the skills that are within the sport. So, we'll be looking at upper-body dominant sport; we'll be looking at lower-body dominant sport, maybe co-dominant sports, for us to understand the finer details of the movement and look at the biomechanical patterns that are related to performance and also related to injury, prevention or management in those sport.

Quite specifically, we'll be also diving into two case studies where we'll be applying all of our knowledge that we have gained from the first six, seven modules to the specific sport, which is tennis and cricket. So, we'll be looking in tennis, we'll be looking specifically at the tennis serve and in cricket, we'll be looking at cricket fast bowling. So, right from your movements are happening at these skills to phasing analysis, which you will learn further in module 6 to the performance and the injury patterns that are underlying in the tennis serve and the cricket fast bowling. Module 8, we'll be looking at integrated disciplines and the opportunities in human movement science. So, it's extremely important for us to understand what disciplines are complementary, what are supplementary, how we can come together and collaborate to broaden our scope of understanding and to also advance the current state of knowledge that is there in the literature.

And that will allow us to then look at research in human movement science. So, we'll very quickly touch base on what research areas are currently up and coming in human movement science, how you can apply research, how you can conduct research and some of the ethics protocols for research as well in the area. We'll also be looking at the scope of human movement science to look at specialized population as well. For example, polio patients or stroke rehabilitation. So, the potential of human movement science to understand and to help better handle injury management.

And the last, not last but not the least, we'll be closing off with career opportunities in human movement science. So, that gives you a good understanding of now that you've learned all of these

modules and you've gone through this journey of understanding what human movement science is, understanding the techniques, how do you identify performance patterns, and how do you identify injury patterns. We'll be looking at where, what kind of work opportunities you can look for, what kind of work areas you can, you know, be employed in. Let's do that again. So, we look at career opportunities in human movement science.

We will be looking at what are the work areas or workplaces that you can apply and take it up as a career, where do you move on from here, and what are the additional courses that you can understand and do for good career opportunities in the field of human movement science. So, the learning outcomes, just to have a quick summary of what we spoke about, by the end of eight modules, you should have a good understanding of the area of study, human movement science, its scope, potential, and future. Also, understand the human body systems that govern movement, that make movement happen, and mechanical understanding of movement, where we talk about biomechanics and the biomechanical patterns and athlete through the lens of athlete through the mechanical lens. We will also be looking at integration of human movement science. Hopefully, you will have a good idea with the area of studies, scope and opportunities, and career opportunities in human movement science as well.