National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Real-Tme Spine Analysis: Bridging Statics and Dynamics with 3D Motion Capture System
Speaker	: Tharani K
Supervisor	: Prof. Ravi Kant Avvari
Venue	: Seminar Room (BM)
Date and Time	: 11 Aug 2025 (3:30 pm)
Abstract	: Postural issues can result from various factors and lead to significant health problems. Numerous traditional methods exist for evaluating the spine; however, they are only capable of static assessment. Rehabilitation depends on an accurate clinical evaluation of lumbar curvature, but there is currently little research on this evaluation in both static and dynamic settings. The inconsistency between video analysis and related pictures is a significant difficulty with dynamic motion stimulus approaches, making it more difficult to assess lumbar curvature during movement. The use of a 3D motion capture device offers a viable method for spinal dynamics investigation in real-time. This study examines the effects of high-heeled (HH) use on spinal posture and biomechanics compared to barefoot (BF) walking. Although there is ample evidence of the detrimental effects of HH usage on spinal health, the majority of studies have relied on static spine examination, which frequently yields contradictory findings. Recognizing the need for dynamic evaluation, this study employs a 3D motion capture system to assess the spine under static and dynamic conditions during different phases of the stance phase using a simple displacement calculation. The findings reveal that wearing HH leads to lumbar compression under static and dynamic conditions and prolonged usage might lead to lower back pain (LBP). Employing a dynamic approach enhances understanding of movement biomechanics while serving as a versatile tool for evaluating other spinal deformities and related conditions, thereby contributing to better comprehension and management of spinal issues. Keywords: lower back pain, 3D motion capture system, lumbar compression, high-heels.