



Sports Performance | Education
Economic Development

Biomechanics Career Paths

1. Athletics Path

Entry Level: Biomechanics Internship/Fellowship in Athletics

These roles are designed for students or recent graduates seeking hands-on experience in athletic performance settings. They support sports scientists and coaches by assisting in athlete monitoring, biomechanics testing, and equipment maintenance.

- **Job Responsibilities** – Assist with athlete data collection (e.g., force plates, motion capture, GPS); help with lab setup and wearable tech; support training, monitoring, and database management; and contribute to research and performance analysis.
- **Education** – Bachelor's degree or current enrollment in biomechanics, kinesiology, exercise science, or related field.
- **License/Certifications** – CPR, AED & First Aid; CSCS or CPSS in progress preferred.
- **Preferred Experience** – Familiarity with wearable technology (e.g., GPS, accelerometers), force plates, basic statistics, experience with coding language is a plus.

Mid-Level: Biomechanist for Sports Performance

These roles are for professionals with several years of experience in sports performance or research labs. Biomechanists at this level work closely with interdisciplinary staff in elite team environments, using advanced motion analysis and coding to drive performance insights and injury prevention strategies.

- **Job Responsibilities** – Conduct motion capture analysis, analyze biomechanical data, support return-to-play decisions, collaborate on applied research projects, and translate results for coaching and medical staff

- **Education** – Master’s (often required) or Ph.D. in biomechanics, mechanical/biomedical engineering, or related field.
- **License/Certifications** – CPR/AED & First Aid, CSCS or CPSS
- **Preferred Experience** – 2+ years in applied biomechanics; experience with high-speed team sports; familiarity with motion capture; experience with coding for data analysis and visualizations; experience working within an interdisciplinary teams

Elite-Level: Director of Performance Biomechanics / Head of Biomechanics

This senior leadership role is responsible for setting the strategic direction, innovation, and operational excellence of sport biomechanics programs. Directors oversee interdisciplinary teams, manage high-level collaborations, and apply cutting-edge biomechanical science to optimize performance, reduce injury risk, and support elite coaching staff.

- **Job Responsibilities** – Direct biomechanics and performance analysis operations; develop strategic plans; lead applied research; manage staff and technology; collaborate with coaches, medical, and sport science teams; represent the program in national/international forums
- **Education** – PhD (or equivalent terminal degree) in biomechanics, kinesiology, engineering, or a related field; advanced academic credentials required
- **License/Certifications** – Advanced sport science credentials and leadership training preferred.
- **Preferred Experience** – 5+ years leading high-performance or research programs; applied work with elite athletes; strong publication; experience managing interdisciplinary teams and biomechanics tech (e.g., motion capture, force plates)

2. Footwear/Tech Path – Biomechanics in Sports Technology & R&D

Entry Level: R&D Biomechanics Intern

These roles are ideal for students or recent graduates seeking hands-on experience in biomechanics and product research within performance footwear and technology companies. Interns contribute to data collection, testing, and interdisciplinary collaboration to support innovation.

- **Job Responsibilities** – Assist with human performance testing (e.g., 3D motion capture and field testing); collect and process biomechanical data; support prototype evaluations; contribute to lab maintenance; support ongoing research in performance fit and product efficacy
- **Education** – Current enrollment in or recent completion of a bachelor's or master's in biomechanics, kinesiology, engineering, or a related field
- **License/Certifications** – Not required; CPR preferred.
- **Preferred Experience** – 6+ months in biomechanics research or lab experience (motion capture, force plates, etc.); basic data analysis skills; familiarity with coding languages; effective communication and teamwork; interest in performance footwear and athlete testing

Mid-Level: Biomechanics Research Scientist

These roles apply biomechanics expertise to drive innovation in footwear design, fit, and performance testing. Engineers at this level lead testing initiatives, analyze motion and pressure data, and contribute to simulation modeling and algorithm development for product optimization.

- **Job Responsibilities** – Lead biomechanics testing for fit and performance; analyze gait, joint kinematics, and pressure data; design lab and field experiments; contribute to footwear simulation modeling and digital twin development; validate results with third-party labs; collaborate with design, engineering, and materials teams
- **Education** – Master's or PhD in biomechanics, kinesiology, mechanical engineering, or a related field.
- **License/Certifications** – Not typically required.
- **Preferred Experience** – 2+ years in footwear and/or human biomechanics research; strong data collection and analysis skills; knowledge of footwear materials; interest in wearable tech and musculoskeletal modeling

Elite-Level: Director of Biomechanics Innovation

These senior roles lead interdisciplinary teams that bridge scientific research and engineering execution to shape the next generation of performance footwear. Directors define the biomechanical vision, manage applied research strategies, and integrate athlete data into product innovation pipelines.

- **Job Responsibilities** – Oversee biomechanics and physiology research for product innovation, set R&D strategy, lead research and engineering teams, translate athlete data into product design, collaborate with academic partners, and secure R&D funding
- **Education** – PhD or equivalent in biomechanics, sports science, engineering, or a related field.
- **License/Certifications** – None required.
- **Preferred Experience** – 7+ years in sports science, biomechanics, or engineering leadership; expertise in athlete performance testing and data analysis; experience managing research teams and applying biomechanics in product development environments

3. Military Path

Entry Level: Human Performance Research Intern

These roles are designed for students or recent graduates seeking hands-on biomechanics research experience related to military performance, injury risk, and human movement. Interns assist with lab testing, data analysis, and research dissemination.

- **Job Responsibilities** – Assist in data collection using motion capture, EMG, and force plates; conduct research on human movement under combat conditions (e.g., lifting heavy loads, using exoskeletons); participate in lab procedures; support research dissemination through conferences or publications
- **Education** – Bachelor's degree (in progress or completed) in biomechanics, kinesiology, engineering, or a related field
- **License/Certifications** – U.S. citizenship required
- **Preferred Experience** – Familiarity with motion capture systems, EMG, and force platforms; experience with data analysis or reporting; interest in military readiness or human performance research

Mid-Level: Research Biomechanist/Tactical Scientist

These roles support the development and testing of military technologies by evaluating human performance and injury risk under cognitive and physical load. Biomechanists help optimize equipment usability, fit, and operational effectiveness.

- **Job Responsibilities** – Conduct human performance testing (motion capture, EMG, force plates); assess impact of advanced systems (e.g., HUDs, VAS) on biomechanics and cognitive load; inform product design and training recommendations through usability testing and performance data
- **Education** – Master's (or Ph.D.) in biomechanics, physiology, kinesiology, or similar
- **License/Certifications** – CSCS or CPSS; U.S. citizenship required
- **Preferred Experience** – 3+ years in applied research; experience with military or wearable tech; experience with coding languages; background in human performance factors, data analysis

Elite-Level: Senior Research Scientist/General Engineer

Senior research leadership role overseeing biomechanics programs supporting warfighter performance and injury prevention. Roles are typically based in U.S. military labs or affiliated research divisions.

- **Job Responsibilities** – Lead applied research in biomechanics (e.g., load carriage, performance testing), manage scientific teams, secure research and development funding, and translate human performance data into operational or equipment solutions.

- **Education** – Ph.D. or equivalent in biomechanics, kinesiology, or related field
- **License/Certifications** – Not required, but strong research leadership is expected.
- **Preferred Experience** – 5+ years leading military or tactical performance research; strong record of publications or patents; experience managing interdisciplinary teams.

4. Hospital/Clinical Path

Entry Level: Biomechanics Research Intern/Fellow

Internship and fellowship roles supporting clinical and orthopedic biomechanics research in hospital settings. Ideal for students or early-career professionals seeking hands-on experience in motion analysis, injury prevention, and medical innovation.

- **Job Responsibilities** – Assist with clinical biomechanics studies; collect and analyze biomechanics data (i.e. motion capture data, force plate data), support research and presentation; collaborate with surgeons and researchers
- **Education** – Enrolled in or recently completed a degree in biomechanics, kinesiology, biomedical engineering, or related field
- **License/Certifications** – CPR/BLS.
- **Preferred Experience** – Some lab or research experience; familiarity with motion capture, force plates, or musculoskeletal modeling; strong academic background and interest in clinical biomechanics

Mid-Level: Clinical Biomechanist/Motion Analysis Specialist

These roles provide technical and analytical support in hospital-based motion labs or clinical research centers. Specialists contribute to patient-centered gait analysis, musculoskeletal assessment, and research on mobility-related conditions.

- **Job Responsibilities** – Perform clinical gait or movement analyses; collect and analyze kinematic, kinetic, and EMG data; maintain and calibrate motion analysis lab systems; collaborate with physicians and therapists; support research protocol execution and clinical reporting
- **Education/Certifications:** Master's degree in biomechanics, biomedical engineering, kinesiology, or a related field
- **License/Certifications** – CPR; PT or CEP license may be required.
- **Preferred Experience** – 2+ years of experience in a clinical gait or motion analysis lab; familiarity with certain demographic preferred depending on the path (i.e. pediatrics, orthopedics, etc.); experience with motion capture systems, EMG, and force platforms

Elite-Level: Senior Biomechanist/Director of Clinical Biomechanics/Research Engineer

These are senior-level clinical research roles that oversee motion analysis programs, direct biomechanics studies, and manage interdisciplinary lab teams. Typically based in hospital-affiliated research centers or academic medical institutions.

- **Job Responsibilities** – Oversee the biomechanics laboratory's operations and research agenda; design clinical protocols; collect and interpret biomechanical data; contribute to

publications, grant proposals, and surgical innovation; collaborate with physicians and academic researchers

- **Education** – Doctoral degree (Ph.D., Sc.D.) in biomechanics, kinesiology, or bioengineering.
- **License/Certifications** – Not required, but research compliance and publication experience needed.
- **Preferred Experience** – 5+ years of applied clinical or research biomechanics experience; proven leadership in research or lab management, with experience in securing grant funding and maintaining a strong publication record