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The Role of Mechanical Engineering in Modern Medicine

Anuja Darokar, Renuka Dhakare, Tanvi Tayde, Samiksha Mhaisane, Aditya Jaiswal

Department of Mechanical Engineering

Dr. Rajendra Gode Institute of Technology & Research, Amravati, Maharashtra, India

Abstract: Mechanical engineering plays a pivotal role in the advancement of modern medicine by enabling the development of innovative technologies, devices, and systems that improve healthcare delivery and patient outcomes. The integration of mechanical engineering principles has led to breakthroughs in medical devices, such as prosthetics, surgical robots, and diagnostic equipment. Advanced imaging technologies, such as MRI and CT scanners, rely on mechanical engineering for precision mechanisms and thermal management. Biomechanics, a key subfield, helps in understanding human movement and developing assistive devices like exoskeletons and orthotics. Additionally, mechanical engineers contribute to the design of minimally invasive surgical tools, artificial organs, and drug delivery systems. Recent advancements in computational modeling and 3D printing have further enhanced the ability to customize treatments, including patient-specific implants and tissue engineering. This interdisciplinary collaboration has not only improved the quality of healthcare but also expanded the possibilities for personalized medicine, early diagnosis, and effective treatment of complex diseases. As technology continues to evolve, the role of mechanical engineering in modern medicine is poised to grow, addressing emerging healthcare challenges and shaping the future of medicine.

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