

# Biomedical Engineering Education Prospects in India

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**Abstract** — The importance of education lies in its scope which should be well-matching with the growing technology. The paper here discusses about the Biomedical Engineering Education. The interface between electrical engineering and the life sciences has grown enormously. The biomedical engineering program has become a globally expanding discipline with time. The BME education in India needs proper planning and designing. In this paper, we discuss the scenario of BME in India and give suggestion for a successful future.

**Keywords** — Biomedical Engineering Education, India, Prospects

## I. INTRODUCTION

Biomedical Engineering has the concept of interdisciplinary engineering which portrays the modern engineering concept. The engineering has been widely accepted in the world and hence may be considered to a globally acceptable discipline. The BME has a strong multidisciplinary integration which involves the electrical, chemical, mechanical, computer and civil engineering. According to NIH, Bioengineering integrates physical, chemical, mathematical, and computational sciences and engineering principles to study biology, medicine, behavior, and health. It advances fundamental concepts; creates knowledge from the molecular to the organ systems levels; and develops innovative biologics, materials, processes, implants, devices, and informatics approaches for the prevention, diagnosis, and treatment of disease, for patient rehabilitation, and for improving health (NIH definition). BME is a constantly changing field.

Hence such a discipline requires careful planning when designing BME educational programs which may produce successful professionals.

These professionals often work in tandem with other life scientists, chemists, and medical

scientists to aid the cause of preventive and curative medicine. Whereas biomedical engineers develop devices, systems and procedures to aid medical research or help solve health and medical problems. The sudden spurt in radical research concepts that have lent a whole new direction to treatment modalities is essentially due to developments in this field.

In this paper, scenarios of Indian university have been given. The objective of this paper is to briefly present the India scenario of BME education, the challenges it faces and the future steps towards the appropriate education of BM engineers for the region.

Biomedical engineering has immense scope for path breaking research.

## II. SCENARIO OF INDIAN UNIVERSITIES WITH BME EDUCATION

### A. Scenario

Previous days, the graduation in a related subject such as electrical, chemical or mechanical engineering and then team this up with a specialization in biomedical engineering.

Generally, biomedical engineers may seem like an elite class of practitioners, the ever-increasing Biomedical engineers who are considered to be the specialists or experts have all had humble beginnings, which can be traced back to an ordinary engineering degree.

However, recently there have been several Bachelor courses in Biomedical Engineering but are less popular as compared to the main stream engineering. In order to specialize in this field most Indian students opt for masters programs. There is also a provision of pursuing master in Biomedical Engineering after completion of their medical degree. But the Ph.D programs in India are very few in number.

Some of the renowned institutes providing BME at the masters and doctoral levels at IIT Mumbai. Banaras Hindu University, Varanasi 221005 (UP) and Birla Institute of Technology and Science, Vidya Vihar, Pilani 333031 (Rajasthan) offer an M.Tech in biomedical engineering.

The chief specialties in this field include bioinstrumentation, biomaterials, biomechanics, cellular, tissue and genetic engineering; clinical engineering; rehabilitation engineering; orthopedic surgery; medical imaging; and systems physiology.