(075-E&E-02-02) ELECTRONICS AND COMMUNICATION ENGINEERING (BIO-MEDICAL)

Significance of the Program:

Day by day, the count of individuals falling prey to lethal illnesses is on the rise. Moreover, the emergence of novel ailments and complications linked to chronic conditions not only complicates the lives of ordinary people but also presents challenges for healthcare experts. The escalating need for medical services and amenities has led to a surge in medical costs. To alleviate this and ease the workload on healthcare professionals, the Biomedical Engineering Program has been initiated at the graduate level. Tailored for individuals with a background in Intermediate level sciences, this program aims to not only produce a larger pool of skilled healthcare professionals but also propel medical technology to new heights. Due to the multidisciplinary nature, the course starts off with foundational aspects spanning mathematics, physics, chemistry and basic sciences. Subsequently, students will be made to learn about the modern tools and technologies used for the biomedical applications, with hands-on exposure through laboratory exercises. In the end, the students will be made to identify and solve a real-world biomedical challenge after visiting nearby hospitals and diagnostic centres as a part of project work.

Career Options:

Biomedical Engineering graduates can have the following opportunities:

- ·They can occupy jobs in hospitals and diagnostic centres to assist doctors in using Biomedical equipment for diagnosing/Treating diseases.
- Biomedical graduates could get offers from biomedical device manufacturing companies to secure roles as production engineers, quality assurance engineers and regulatory affairs specialists.
- By blending the technical expertise with sales skills, students have the opportunity to pursue a career as medical device sales engineer.
- Students have the option to pursue advanced studies such as M.Tech and subsequently Ph.D., in emerging biomedical fields like Medical robotics, Instrumentation and Biomedical signal processing.

- Government organisations like National Institute of Immunology (NIL), All India Institute of Medical Sciences (AIIMS) and National Institute of Health and Family Welfare (NIHFW) offer financial aids to students for initiating startups and to work collaboratively.

Program Objectives:

1. To Cultivate student's qualitative and quantitative skills to address engineering challenges in the context of societal healthcare.
2. To nurture the ability to conduct research autonomously and collaboratively while upholding ethical principles without compromise.
3. To foster entrepreneurial capabilities to thrive in the conditions of ever-changing health care demands.

Outcomes of the Program:

- Enables them to employ advanced concepts acquired during the course to design and develop components and systems for healthcare applications.
- Enables them to utilise cutting-edge tools, both physical and software based, to design cost-effective medical systems for the betterment of humanity.
- Enables them to generate ideas for establishing their own companies, fostering mutual benefits for themselves and the society.
- Enables them to synergize technical and managerial skills, coupled with the ethical values, towards creating a disease-free and contended society.
- Enables them to amalgamate engineering and biology knowledge, to minimise the physical suffering caused by diseases and to contribute to a healthier society.

Major Course Outlines:

1. Electronic Devices and Circuits.
2. Biomedical Devices.
3. Sensors and Transducers in Healthcare.
4. Biomedical Instrumentation.
5. Clinical Health care
6. Biomaterials Engineering.
7. Digital Signal Processing.
8. Biomedical Signal Processing.