COURSE	Name	: Biomedical Measurement and Instrumentation
	Code	: EE185545
	Credit(s)	: 2
	Semester	: (Elective Course)

Description of Course

The Biomedical Measurement and Instrumentation Course is a course that studies the principles of biopotential measurement and the design of its instruments, including: biomedical sensor basis, current and future biomedical instrumentation techniques, understanding transducers and biopotentials as input to biomedical instrumentation. The course is also aimed to understand computer-based biomedical instrumentation techniques, maintenance and security of biomedical instrumentation.

Learning Outcomes

Knowledge

(P02) Mastering engineering concepts and principles to develop the necessary procedures and strategies for systems analysis and design in the areas of power systems, control systems, multimedia telecommunications, electronics, intelligent multimedia network, or telematics.

Specific Skill

(KK04) Being able to implement alternative solutions of engineering problems by concerning in factors of economy, public health and safety, culture, social, and environment.

General Skill

(KU04) Being able to identify the scientific field that becomes the object of his research and positions into a research map developed through interdisciplinary or multidisciplinary approach.

Attitude

(S09) Demonstrating attitude of responsibility on work in his/her field of expertise independently.

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the basic concepts of biomedical measurement and instrumentation

Specific Skill

Able to design and realize biomedical measurement and instrumentation systems.

General Skill

Able to use software to do simulations

Attitude

Demonstrate the attitude of being responsible for the work in his area of expertise independently.

Working together to be able to make the most of their potential.

Main Subjects

1. Basic Concepts of Biomedical Instrumentation
2. Biopotentials and basic laws related to currents in biological networks
3. Principles of transducers and types of biomedical electrodes
4. Biopotential amplifiers and instrumentation for ECG, EEG, EMG, analog filtering, strengthening models, equipment for monitoring and patient care
5. EMG and EEG
6. Blood Pressure measurement
7. Biomedical wireless monitoring system, Telemonitoring & Telemedicine
8. Lab instrumentation, diagnostics, radioisotopes and X-rays
9. Electric safety of medical equipment.

Reference(s)

[1] Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices, D. PRUTCHI, M. NORRIS (2005)
[2] Sensor in medicine
[3] Medical Instrumentation, Webster
[4] Medical Physics, J.R. Cameron, J.G. Skofronick
[5] Handbook of medical instrumentation

Prerequisite(s)

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