King Saud University
College of Applied Medical Sciences
Department of Biomedical Technology
BMT313 Biomedical Electronics (III)   3 (2-1-0)

Current Instructor: Eng. Amr Radwan, Dr. Ali Saad and Dr Javeed Shaikh Mohammad
Course Coordinator: Dr. Ali SAAD
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Textbook(s) and/or Other Required Materials:
a) **Primary:** operational amplifiers with Linear integrated circuit, Fourth Edition, William Stanley, Prentice Hall Electronics, 2002, ISBN: 0-13-032013-7.

Course Description :
This course continues the coverage of the electronic courses, it cover the operational amplifier, operational amplifiers application in linear and complex domains. It covers also the integrated circuits, instrumentation amplifiers and others. Study all kind of filters, filter design. Comparators and their application in medical instrument; oscillators and their application in medical instrument.
http://faculty.ksu.edu.sa/alisaad/Pages/BMT113.aspx

Prerequisites: BMT212 biomedical electronics (2)
Co-requisite: None
Course Type: Mandatory
Language of Teaching: English.

Course Learning Outcomes:
Upon completing BMT313, students should have the following capabilities:
- Understand the basics of operational amplifier and Integrated Circuits (IC).
- Application of IC to medical instrumentation.
- Develop an ability to design and analyze electronic circuits.
- To be able to conduct standard tests and measurements; to conduct, and interpret experiments.

Student Outcomes Covered by Course:
a. an ability to select and apply the knowledge, techniques, skills, and modern tools of biomedical technology to include the application of circuit analysis, analog and digital electronics, microcomputers, biomechanics, biomedical instrumentation systems, and safety in the building, testing, operation, and maintenance of biomedical equipment.
Students select and apply the knowledge, techniques, and skills of analog electronics to analog system related activities

b. an ability to select and apply a knowledge of mathematics, chemistry, physics, and biological sciences, engineering, and technology to building, testing, operation, and maintenance of biomedical equipment and the ability to utilize statistics/probability, transform methods, discrete mathematics, or applied differential equations in support of biomedical systems.

c. an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.

d. an ability to analyze, design, and implement biomedical systems, components or processes for broadly-defined engineering technology problems appropriate to program educational objectives.

e. an ability to function effectively as a member or leader on a technical team.

f. an ability to identify, analyze, and solve broadly-defined biomedical technology problems.

g. an ability to apply written, oral, and graphical communication in both technical and nontechnical environments; and an ability to identify and use appropriate technical literature.

h. an understanding of the need for and an ability to engage in self-directed continuing professional development.

i. an understanding of and a commitment to address professional and ethical responsibilities including a respect for diversity.

j. a knowledge of the impact of engineering technology solutions in a societal and global context and an understanding of the clinical application of biomedical equipment.

k. a commitment to quality, timeliness, and continuous improvement.

Major Topics covered and schedule in weeks:

1. Operational Amplifier
2. OP-Amp Application
3. OP- Amp with complex impedance
4. OP- Amp with complex impedance Application
5. Active filters
6. comparators
7. Astable Multivibrator (oscillators)