Course Specifications

Program(s) on which this course is given:	Systems and Biomedical Engineering
Department offering the program:	Systems and Biomedical Engineering
Department offering the course:	Systems and Biomedical Engineering
Academic Level:	Third year
Date	2015-2016
Semester (based on final exam timing)	■ Fall □ Spring

A- Basic Information

1. Title:	Medical Electronics and Measurements			**Code:**	SBE 303A			
2. Units/Credit hours per week:	Lectures	3	Tutorial	1	Practical	1	Total	5

B- Professional Information

1. Course description:

After completing the course the students are expected to have acquired basic knowledge in:

- Sources and properties of biomedical signals.
- Data acquisition and distribution systems.
- Different kinds of transducers and analog signal conditioning.
- Building blocks and analog components of medical devices.

2. Intended Learning Outcomes of Course (ILOs):

a) Knowledge and Understanding

1- Understand basic components of electronic medical equipment.

b) Intellectual Skills

2- Design and analyze common analog electronic circuits for medical devices

3- Write a technical report and/or design specifications.

c) Professional and Practical Skills

4- Work as part of an team to complete a technical projects

5- Present their work

d) General and Transferable Skills

6- Effectively manage tasks, time, and resources.

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Sampling Theory	8	6	2
Digital to Analog Converter	4	2	2
Analog to Digital Converter	8	4	4
Sample & Hold and Analog Multiplixer	6	4	2

Sources and properties of biomedical signals	2	2	
Electrodes, sensors, and transducers	8	4	4
Instrumentation electronics	4	2	2
Bio-potential Electrodes, and Amplifiers	4	2	2
Examples of Medical Equipment Design	4	2	2
4. Teaching and Learning Methods	Lectures (*)	Practical Training/ Laboratory (*)	Seminar/Workshop ( )
	Class Activity ( )	Case Study ( )	Projects (*)
	E-learning ( )	Assignments /Homework (*)	Other:

5. Student Assessment Methods

• **Assessment Schedule**	**Week**
-Assessment 1; Report	2
-Assessment 2; Labs	4,5,6,9
-Assessment 3; Midterm Exam	8
-Assessment 4; Project	11
-Assessment 5; Final Exam	16
• **Weighting of Assessments**	
-Mid-Term Examination	%20
-Final-term Examination	%60
-Project and laboratory examination	%15
-Class work	%5
-Total	125

6. List of References

- J. Webster, Medical Instrumentation: Applications and Design, John Wiley & Sons, 4th ed, 2009. ISBN 0-471-67600-3.
- Willis J. Tompkins and John G. Webster, Eds, “Design of Microcomputer-Based Medical Instrumentation”, CH2.

7. Facilities Required for Teaching and Learning

- Classroom White board (*)
- Classroom Laptop and data-show (*)
- Electronics Laboratory (*)
- Computer Laboratory ( )
- Others ( )

Course Coordinators:	**Dr. Ahmed Salah El Din Mohamed & Dr. Ahmed Ehab Mahmoud**
Head of Department:	**Prof. Dr. Ahmed Badawi**