

## Course Syllabus

### Second Semester - 2013/2014

#### General Information

Course name	Course code	Credits	Contact hours
Biomedical Mechanical Equipment 1	BMTS353	2 lecture+1 lab	2 lecture+2 lab

#### Instructors/ Coordinators

	Instructor	Coordinator
<b>Name</b>	Mr. Ahmed Alassaf	Dr. Santanaraj Balakrishnan
<b>Email</b>	am.alassaf@mu.edu.sa	s.balakrishnan@mu.edu.sa
<b>Ext</b>	2853	2895

#### Text Book

<b>Title</b>	Introduction to biomedical equipment technology
<b>Author/Year</b>	Joseph J. Carr & John M. Brown / 2000

#### Supplemental materials

Recommended Textbooks and Reference Material	
<b>Title</b>	Handbook of Biomedical Instrumentation
<b>Author/Year</b>	R. S. Khandpur / 2003
Electronic Materials (e.g. Web Sites, Social Media, Blackboard, etc.)	
<b>Web sites</b>	<a href="http://onlinelibrary.wiley.com/book/10.1002/0471732877">http://onlinelibrary.wiley.com/book/10.1002/0471732877</a>
	<a href="http://books.google.com.sa/books/about/Biomedical_instrumentation_and_measureme.html?id=_E5RAAAAMAAJ&amp;safe=on&amp;redir_esc=y">http://books.google.com.sa/books/about/Biomedical_instrumentation_and_measureme.html?id=_E5RAAAAMAAJ&amp;safe=on&amp;redir_esc=y</a>

#### Specific Course Information

<b>a. Brief description of the content of the course (Catalog Description)</b>
This course provides an understanding of the basics of mechanics, its relation with biomechanics, fields where biomechanics applies, establish the ability to use the basics of mechanics acquired and apply it to biomechanics systems in different areas. Stress-strain relationships and principal stress/strain components are investigated via Mohr's circle. It also covers the basics of fluid mechanics, and methods of pressure calculation and measurement on viscous and non-viscous basic fluid especially on blood flow in circulatory system as well as application of such principles in medical equipment.
<b>b. Prerequisites (P) or Co-requisites (C)</b>
(P) Physics of Medical Equipment - BMTS244
<b>c. Course type (Mandatory or Elective)</b>
Mandatory

### Specific Goals

#### a. Specific outcomes of instruction

By the end of this course, the student should be able to:

- Demonstrate the study of biomechanics as applied in human system. (b)
- Examine the physical concepts of mechanical properties of materials and fluids. (c)
- Recognize and relate the mechanical principles as applied in working of some medical instruments used in hospitals. (b)
- Illustrate the techniques of medical equipment, such as Sphygmomanometer, Suction, Infusion pumps, Suction Apparatus (Aspirator), blood flow measurement to solve medical problems. (f)

#### b. Student outcomes addressed by the course

a	b	c	d	e	f	g	h	i	j	k
	✓	✓			✓					

### Brief list of topics to be covered

Topics	No of Weeks	Contact hours
Basic Biomechanics	2	8
Mechanical Properties and Elasticity of materials	2	8
Fluid Mechanics	2	8
Viscosity & its application aspects	1	4
Methods of pressure calculation and measurements	1	4
Introduction to Cardiovascular system & Blood Flow Measurement	1	4
Blood Pressure Measurement (Non-invasive & Invasive), Sphygmomanometer & their types, Pressure sensors	2	8
Types of Pumps and application in Medical, Suction Unit, Syringe & Infusion Pumps	2	8
Biomechanical equipment: Electrohydraulic Operation Table, Dental Chairs, Humidifier, Water Distiller etc.	2	8