Course Syllabus: to given to students at the first week of the semester

**1st semester, 1438 /1439 H**

|  |  |
| --- | --- |
| Course title and code: **Biomedical Electronic-6; 414 BMT** |  |
| Program in which the course is offered: **Biomedical Technology-instruments** |  |
| Credit hours 3  |  |
| total contact hours per semester: 56 |  |
| Level at which this course is offered: 8 |  |
| Course prerequisites: 313 , 415 |  |
| Time: Wed from 10 to 11:50 Am |  |
| Location: room 17 |  |
| College member responsible for the course Ali Saad  |  |
| Contact information: |  |
| Office Number: 2117 (quality and Accreditation college office) |  |
| Phone : **(+966)14693772** |  |
| Email: **email:** **Alisaad@ksu.edu.sa****,** |  |
| Website: http://faculty.ksu.edu.sa/alisaad |  |
| Office hours: Sunday 10 to 12 pm Monday 10 to 12 pm  |  |
|  Course Description |
| This course is about Medical electronic instruments, the course content was upgraded during 4 semesters new instruments where introduced and mainly the course take its contents from John Webester famous book and also power point presentation for chapters are interactive. During this course students are exposed to different medical instruments, starting by defibrillators/cardioverters were design and calculation of defibrillator system and components including the capacitor value for certain condition. The second chapter is about cardiac arrhythmias, and different type of pacemakers and electrodes used for heart pacing. The third chapter deals with electro-surgery and ablation a detailed description of the electronic system is presented. Block diagram are analyzed. Laser in medical instruments is introduced, Cardiac output current methods are tackled. EEG, EMG and ENG method for signal acquisition and analysis are presented, MRI for 3D image reconstruction is also presented in digital aspect. A project exposing students for new research in the field has been implemented. Every group of 2 or 3 students choose one papers related to the course topics using open access sources available in the internet (like BiomedCentral, KSU library digital databases and SDL) The research papers project introduced has proven to be very useful. It introduce student to research problem. It exposed the students to new research problem and instruments. Most of the students have benefited from this experience. |
| Course Objectives |
| * + Describe a large group of electronic medical instruments existing at the hospital.
	+ Develop an ability to design and analyze medical instrument.
	+ Conduct standard tests and measurements; conduct and interpret experiments; present technical reports related.
 |
| Teaching strategies |
| PowerPoint presentation, Lecture, debates, PBLGroup Discussion, whole group and small group discussionbrainstorming, small group work; projects Team work individual presentation |
| Learning Resources |

|  |
| --- |
| 1. List Required TextbooksMedical instrumentation Application and design, third edition, John Webster, John Wiley &Sons, 1998. |
| 2. List Essential References Materials (Journals, Reports, etc.)Personal notes are delivered to students via Learning Management system (LMS) BlackBoard. |
| 3. List Recommended Textbooks and Reference Material (Journals, Reports, etc) Open Access biomedical engineering online, Biomed central website |
| 4. List Electronic Materials (eg. Web Sites, Social Media, Blackboard, etc.)There are a webpage in my personal website (<http://faculty.ksu.edu.sa/alisaad> then choose 414BMT) includes, PowerPoint presentations and word documents.<http://ocw.mit.edu/courses/find-by-topic/#cat=healthandmedicine&subcat=biomedicalinstrumentation> |
| 5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.Youtube videos describing Electro-surgery and ablations defibrillation and others. <http://www.youtube.com/watch?v=7LW78yoaEe0>.<http://www.youtube.com/watch?v=3trpw_We0UQ> |

|  |
| --- |
|  |
|

|  |
| --- |
| **1 Topics to be Covered**  |
| **List of Topics** | **No of****Weeks** | **Contact hours** |
| **Defibrillators/Cardioversion** | 2 | 8 |
| **Pacemakers** | 2 | 8 |
| **Electro-surgery instruments and methods** | 1 | 4 |
| **Ablation procedure and instruments** | 1 | 4 |
| Medical L-A-S-E-R | 1 | 4 |
| **EEG Brain signal measurement and analysis** | 2 | 8 |
| **Catheterization & Cardiac Output** | 2 | 8 |
| **Magnetic ResonanceImaging (MRI)** | 2 | 8 |

 |
| **5. Schedule of Assessment Tasks for Students During the** **Semester** |
|  | **Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)** | **Week Due** | **Proportion of Total Assessment** |
|  | Midterm1- essay | 6 | 15% |
|  | Midterm2- essay | 12 | 15% |
|  | Practical exam + reports | 13 | 20% |
|  | Project (research paper): oral presentation | 14 | 5% |
|  | Final exam | 16 | 40% |
|  | Quiz | Cont. | 2%  |
|  |  Homework | Cont. | 3% |