

**DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COURSE SYLLABUS**

EE 474: Safety Reliability and Maintenance in Health Care

<i>COURSE TITLE</i>	<i>CODE & NUMBER</i>	<i>SUBJECT AREA</i>	Contact Hours			Credit Units
			<i>Th.</i>	<i>Pr.</i>	<i>Tr.</i>	
Safety Reliability and Maintenance in Health Care	EE474	Engineering	3	1	0	3
<i>Pre-requisites:</i>	EE370					
<i>Course Role in Curriculum (Required/Elective):</i>	Required course					
<i>Catalogue Description:</i> Definition of safety. Electrical, gas, and fire safety and how to make safe environment for patients, medical personnel and attendants. Reliability in health care facilities. Training of operators for proper use of equipment. Generation of a computer database for equipment, suppliers, dealers and manufacturers. Preventive maintenance procedures. Corrective maintenance, repair and amendment of existing equipment. Basic troubleshooting principles. Retrieving information from manufacturer's catalogs and technical libraries.						

Textbooks:

(Author, Title, Pub., year)

D. Yadin, W.W. von Maltzahn, M.R. Neuman, and J.D. Bronzino (Editors), Clinical Engineering (Principles and Applications in Engineering), CRC Press; 2003

Supplemental Materials:

Notes, JCI Manual and Internet Search for Relevant Published Standards

Course Learning Outcomes:

By the completion of the course the students should be able to:

1. Recognize national and international standards for safety, reliability and Maintenance
2. Definition of safety, reliability and maintenanc
3. Design processes to improve safety in healthcare environment
4. Interpret, use, and develop processes to comply with standards
5. Sketch the essential blocks of a service department
6. Compare policies, procedures and maintenance documents
7. Estimate failure rates of hospital equipment and plan maintenance services accordingly
8. Formulate an optimum the spare and repair parts storage to minimize the downtime of equipment
9. Coordinate and work as a member of a maintenance team
10. Sketch a typical hospital organization chart and describe the possible roles of biomedical engineers in different positions in this chart

Topics to be Covered:**Duration
in Weeks**

- | | | |
|----|--|---|
| 1. | Definition of safety, reliability, and maintenance | 1 |
| 2. | Electrical, gas, and fire safety and how to make safe environment for patients, medical personnel, and attendants. | 2 |
| 3. | Reliability in health care facilities. Essential steps to improve safety in healthcare environment. Interpret, use, and develop processes to comply with standards. Estimate failure rates of hospital equipment and plan maintenance services accordingly | 3 |
| 4. | Sketch the essential blocks of a service department | 1 |
| 5. | Hospital organization chart and the possible roles of biomedical engineers in different positions in this chart | 1 |
| 6. | National and international standards for safety, reliability and Maintenance like JCI, NFPA, AHA, AAAMI, OSHA, ASHRAE, MSDS, KACST, SBAHI, etc. | 4 |
| 7. | Corrective maintenance, repair and amendment of existing equipment. | 1 |
| 8. | Retrieving information from manufacturer's catalogs and technical libraries | 1 |

Key Student Outcomes addressed by the course: (Put a ✓ sign)

(1) An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
(2) An ability to apply the engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	
(3) An ability to communicate effectively with a range of audiences	✓
(4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	✓
(5) An ability to function effectively on a team whose members together provide leadership, creates a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	
(7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	✓

Instructor or course coordinator: Dr. Abdulhameed F. Alkhateeb

Last updated: Spring 2020