



هيئة تقويم التعليم

Education Evaluation Commission

المركز الوطني للتقويم والاعتماد الأكاديمي  
National Center for Academic Accreditation and Evaluation

## **ATTACHMENT 5.**

### **T6. COURSE SPECIFICATIONS (CS)**

**Phys 591**

**Principles of Biophysics**

**By**

**Dr. Amany Abdullah Aly**

## Course Specifications

Institution: King Saud university	Date: 9/3/2018
College/Department : College of Science / Physics and Astronomy	

### A. Course Identification and General Information

1. Course title and code: Principles of Biophysics Phys591			
2. Credit hours: 3(3+0)			
3. Program(s) in which the course is offered. Physics Program (If general elective available in many programs indicate this rather than list programs)			
4. Name of faculty member responsible for the course Dr. Amany Abdullah Aly			
5. Level/year at which this course is offered: Graduate Course for M.Sc.			
6. Pre-requisites for this course (if any): non			
7. Co-requisites for this course (if any): None			
8. Location if not on main campus: Girl Campus for Female			
9. Mode of Instruction (mark all that apply):			
a. Traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="50%"/>
b. Blended (traditional and online)	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="50%"/>
c. E-learning	<input type="checkbox"/>	What percentage?	<input type="text"/>
d. Correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments: Presentations of all lectures on line with discussion and comments			

## B Objectives

What is the main purpose for this course? The main objectives of this course is teaching the students how to get the main items of the course through searching in the library. Background and survey as an introduction to medical physics. Students should learn most of the techniques required for the used therapy and diagnosis instruments, in addition to other skills. At the end of the course the students should write a summary or conclusion, in addition their comments on how they can improve the topics of the course as well as addition of other important topics related to the course.

1. Biological cell and membrane structures. Membrane permeability
2. Permeability barrier. Active transport. Nernst Potential.
3. Different models of membrane system. Liposomes and its applications.
4. Functional organization of the human body and the control of internal environment.
5. Hemostasis. Blood composition and coagulation; rheology of blood. Structure of heart & heart muscles.
6. The electrocardiogram (ECG). The regulation of circulation.
7. Hemodynamics of blood (blood flow and pressure). Macro-circulation and microcirculation. physiological biophysics techniques.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

1. The course syllabus and materials were posted on the department Website that could be accessed by the students enrolled in the course.
2. The student should prepare some of the topics of the course with presenting a lecture on line, in addition of performing Homework's to carefully understand the lectures
3. Inserting some animation websites and using the library for explaining all of the course topics

## C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description: Note: General description in the form used in Bulletin or handbook

### 1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Biological cell and membrane structures. Membrane permeability	2	6
Permeability barrier. Active transport. Nernst Potential	2	6
Different models of membrane system. Liposomes and its applications	2	6



Functional organization of the human body and the control of internal environment	2	6
Hemostasis. Blood composition and coagulation; rheology of blood. Structure of heart & heart muscles.	2	6
The electrocardiogram (ECG). The regulation of circulation.	2	6
Hemodynamics of blood (blood flow and pressure). Macro-circulation and microcirculation. physiological biophysics techniques.	2	6

2. Course components (total contact hours and credits per semester): 26 hours credit 2 hours/week

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planned	3					
	Actual	3					
Credit	Planned	3					
	Actual	3					

3. Additional private study/learning hours expected for students per week. 3

4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

**On the table below are the five NQF Learning Domains, numbered in the left column.**

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Biological cell and membrane structures. Membrane permeability		
1.2	Permeability barrier. Active transport. Nernst Potential		
1.3	Different models of membrane system. Liposomes and its applications		
1.4	Functional organization of the human body and the control of internal environment		
1.5	Hemostasis. Blood composition and		



	coagulation; rheology of blood. Structure of heart & heart muscles.		
1.6	The electrocardiogram (ECG). The regulation of circulation.		
1.7	Hemodynamics of blood (blood flow and pressure). Macro-circulation and microcirculation. physiological biophysics techniques.		
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	The ability to be aware about the different models of membrane system. Liposomes and its applications		
2.2	To understand and know the hemostasis. Blood composition and coagulation; rheology of blood. Structure of heart & heart muscles.		
	The ability to know the electrocardiogram (ECG). The regulation of circulation.		
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Work as a part of a team, or can work independently		
3.2	Communicate the results of the work with the others		
3.3	Manage resources, time and other members of the group		
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1			
4.2			
<b>5.0</b>	<b>Psychomotor</b>		
5.1	Not Applicable		
5.2			

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Class activities (oral presentation on line; quizzes and homework)	Each week	20%
2	Mid Term Exam.	9	20%
4	Report on all parts of the course item using the net work	14	20%
5	Final Exam.	15	40%



6			
7			
8			

#### D. Student Academic Counseling and Support

1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)

4 hours / week

#### E Learning Resources

##### 1. List Required Textbooks

1-Textbook of medical physiology / Arthur C. Guyton, John E. Hall.—11th ed.  
2. Human physiology. 2. Physiology, Pathological. I. Title: Medical physiology. II. Hall, John E. (John Edward) III.  
3-MEDICAL PHYSICS ANDBIOMEDICAL ENGINEERINGB H Brown, R H Smallwood, D C Barber, P V Lawford and D R HoseDepartment of Medical Physics and Clinical Engineering, University of Sheffield and Central Sheffield University Hospitals,Sheffield, UK  
Institute of Physics PublishingBristol and Philadelphia

##### 4. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

Websites related to Biophysics, Medical Physics, Introduction to Medical Physics, and Introduction to Health Physics.

5. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

All programs or software's which explain the biomedical Physics

#### F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)

1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)

1. Lecture room with max. of 25 seats

2. Auditorium of capacity of not less than 100 seats for large lecture format classes.

2. Technology resources (AV, data show, Smart Board, software, etc.)

3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

## G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching

- i. Course Evaluation by the Student
- ii. Students Faculty Meeting

2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department

- i. Peer consultation on teaching
- ii. Departmental council discussions
- iii. Discussions within the group of faculty teaching the course.

3. Processes for Improvement of Teaching

- i- Conducting workshops given by experts on the teaching and learning Methodologies.
- ii- Periodical departmental revisions of its methods of teaching
- iii- Monitoring of teaching activates by senior faculty members.

4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution)

- i- Providing samples of all kind of assessment in the departmental course portfolio of each course.
- ii- Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy.
- iii- Conducting standard exams such as the American Chemical Society exams or others.

5. Describe the planning arrangements for periodically reviewing course effectiveness and

planning for improvement.

- i- The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils.
- ii- The head of department and faculty take the responsibility of implementing the proposed changes.

Name of Course Instructor: Prof. Dr. Mohamed Anwar K Abdelhalim

Signature: Dr. Amany A Aly Date Specification Completed: 9/3/2018

Program Coordinator: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_