

# TEMPLATE FOR COURSE SPECIFICATION

## HIGHER EDUCATION PERFORMANCE REVIEW: PROGRAMME REVIEW

### COURSE SPECIFICATION

This Course Specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. It should be cross-referenced with the programme specification.

1. Teaching Institution	University of Baghdad / Alkharizmi College of Engineering
2. University Department/Centre	Biomedical Engineering Department
3. Course title/code	Transport Phenomena
4. Programme(s) to which it contributes	B.Sc. Biomedical Engineering
5. Modes of Attendance offered	Full Time
6. Semester/Year	1 Course
7. Number of hours tuition (total)	45 Hours for each course
8. Date of production/revision of this specification	2018

#### 9. Aims of the Course

This course aims at providing the student with the necessary basic and advanced concepts for the followings:

1. Principles to engineering applications track is to educate and train scientists, physicians, and engineers in the physical, biological, and clinical bases of the cardiovascular system.
2. The objective of this track is to enable them to develop innovative applications in this field while employed in the implantable cardiovascular medical device industry. This rapidly growing sector needs people with double training in fundamental bioengineering and clinical skills.

## **10• Learning Outcomes, Teaching ,Learning and Assessment Method**

### **A- Knowledge and Understanding**

Graduates will be able to:

- A1.** Use their information and thoughtful of the appropriate modelling, scientific and computational tools that support medical instrumentation, to solve, in depth, analytical, design or theoretical problems in this field.
- A2.** Apply their data and understanding of physical and clinical laws, arithmetic analysis in order to model medical device and any other similar systems.
- A3.** Explain the role of Biomedical Engineers in medical instrumentation group of work and the constraints within which their clinical judgment will be exercised.

### **B. Subject-specific skills**

- B1.** Discuss the principles of general block diagram for medical systems.
- B2.** Discuss the design requirements and specifications, the preliminary stages of designs and their modified action and work, via series of videos and figures.
- B3.** Use the preliminary understanding to build a virtual explanation for the desired and undesired plan of design.
- B4.** Discuss the ability to explain new modification and the new trend of clinical supportive works.

### **Teaching and Learning Methods**

The teaching and learning of such important Course include the followings:

- 1. Lectures by the instructor himself explaining the main and important points of design.
- 2. Free discussion of the brain storm presented at the lecture times and discuss the new and future trends.
- 3. Seminars presented by the student and discussed directly by the other student and instructor.
- 4. Discussions of important points and induced ideas through social media.

### **Assessment methods**

- 1. Seminar presented and discussed.
- 2. Site visited through group of students and under supervising of official medical company.
- 3. Home works and challenges of design thoughts.
- 4. Quizzes and exams.

### **C. Thinking Skills**

- C1.** Apply appropriate analytical mathematics, scientific and engineering tools to the analysis of problems;
- C2.** Analyze and solve engineering problems;
- C3.** Design a medical device system, component or process to meet a need;
- C4.** Integrate knowledge and understanding of other scientific, mathematical, computational or engineering disciplines in order to support their engineering specialization.

### **Teaching and Learning Methods**

- Internal lectures from manufacturers or clinicians;
- Feedback given to students during tutorials;
- Question and answer sessions during lectures or staff Office Hours;
- Guided reading of texts, journal articles etc., for individual and group projects;

### **Assessment methods**

- Individual written report(s).
- Group discussions of group work brainstorm case studies.
- Practical skills will be assessed through troubleshoot technique.
- Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
- Presentation skills through group presentations and poster presentations.

### **D. General and Transferable Skills (other skills relevant to employability and personal development)**

- D1.** Apply in depth problem solving and analytical thinking to a diverse range of problems;
- D2.** Use appropriate multi-disciplinary skills to solve medical device problems, combining the biological and engineering knowledge gained through the degree;
- D3.** Demonstrate numeracy and literacy in written reports, project work and examinations;
- D4.** Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

## 11. Course Structure

Week	Hours	ILOs	Unit/Module or Topic Title	Teaching Method	Assessment Method
<b>First course</b>					
1	3		Introduction to physiological fluid mechanics		
2	3		Basic concepts in fluid mechanics		
3	3		Viscosity		
4	3		Hematology and blood rheology		
5	3		Fluid flow		
6	3		Shear stress in fluids		
7	3		Solution of problems		Quiz 1
8	3		Poiseuille's law		
9	3		Mass, Bernoulli and Energy Equations		
10	3		Solution of problems		Quiz 2
11	3		Friction coefficients of pipe flow		
12	3		Head loss		
13	3		Fluid statics and measurement of pressure		
14	3		Solution of problems		
15	3		Mid exam		

12. Infrastructure	
Required reading: · CORE TEXTS · COURSE MATERIALS · OTHER	<ol style="list-style-type: none"> <li>1. Introduction to Fluid mechanics. Y. Nakayama</li> <li>2. Fluid Flow for Chemical Engineers by F. A. Holland</li> <li>3. Applied Biofluid Mechanics, by Lee Waits and Jerry Fine McGraw Hill, 2007.</li> </ol>
Special requirements (include for example workshops, periodicals, IT software, websites)	Check the new modern websites talking about the new modifications
Community-based facilities (include for example, guest Lectures , internship , field studies)	

13. Admissions	
Pre-requisites	BME 445
Minimum number of students	20
Maximum number of students	30