COURSE SPECIFICATION

(Materials Science and Tissue Engineering: Nanotechnology and stem cells)

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Programme offering the course:	Postgraduate PhD degree of Regenerative Medicine/ RMD
(2) Department offering the programme:	Inter-departmental Faculty of Medicine
(3) Department responsible for teaching the course:	Clinical Pathology Department
(4) Part of the programme:	Second part (SemesterVI)-Elective
(5) Date of approval by Faculty council	9/8/2016
(6) Date of last approval of programme specification by Faculty council	9/8/2016
(7) Course title:	Materials Science and Tissue Engineering: (Nanotechnology and stem cells)
(8) Course code:	RMD630RS4
(9) Total credit hours:	2 Theoretical + 1.5 Laboratory/Practical + 0.5 field work

(B) Professional information

(1) Course Aims:

The broad aims of the course are as follows:

This course provide students with knowledge about the fundamentals in tissue engineering and the challenges of imitating natural tissue contexts. They are familiar with the tools from biology, chemistry and physics that are necessary to control tissue development in vitro.

This course establishes the fundamental concepts of designing artificial scaffolds tailored for specific clinical applications. It is meant to parallel questions addressed in the medical part of the master course.

By the end of the course the students will know the governing principles of engineering tissues. They will understand the rationale for tailoring chemical and mechanical properties of materials for specific medical applications. They will know about the most current research in bioengineering and are able to prepare basic matrices for tissue replacement.

(2) Intended Learning Outcomes (ILOs):

On successful completion of the course, the candidate will be able to:

B-Intellectual skills:

On successful completion of the programme, the candidate will be able to:

B2: Identify the ethical implications of the work in the field of regenerative medicine.

B7: Display awareness of the possibilities and limits of stem cells.

C- Professional/practical skills:

On successful completion of the programme, the candidate will be able to:

C1: Practice appropriate laboratory skills, including safe working practices where relevant.

D- Communication & Transferable skills:

On successful completion of the programme, the candidate will be able to:

D1: Communicate effectively using a variety of formats.

D2: Use effectively a range of information sources.

(3) Course content:

Subjects	Lectures	Clinical	Laboratory	Field	Total Hours
Material Sciences – Nanotechnology / RMMD– BS4					2 hours/15W
1- Biotechnology (Overview) 2- Stem cells and Biotechnology 3- Nanobiotechnology 4- Nano-materials Properties 5- Nano-material synthesis 6- Carbon nanotubes 7- Nano-sensors 8- Nano-devices 9- Nanocomposites 10- Bio-nanocomposites 11- Optical properties of nanomaterials 12- Applications -1 (Neuroscience) 13- Applications- 2 (orthodontics) 14- Applications-3 (orthopedics) 15- Applications -4 (other systems)	2		1.5	0.5	4 hours

(4) Teaching methods:

4.1: Lectures

4.2: Practical lab work

(5) Assessment methods:

5.1: Exam Description

The final exam is composed of:

Two written exams (100 marks) 2 hours (Short Essay questions 1 hours 80 marks + MCQ 1 hour 20 marks)

Other logbook activities (Practical part of the course and scientific activities) are assessed by supervisor of the activity without marks

5.2: Marks

Course/ code	Marks					
	Written Exam			Practical Exam	Oral Exam	Total
	Short Essay questions	MCQ	total			
Materials Science and Tissue Engineering: (Nanotechnology and stem cells)/ RMD630RS4	**80**	**20**	**100**	--	--	**100**

(6) References of the course:

Text books: Understanding Nanomedicine: An Introductory Textbook

(7) Facilities and resources mandatory for course completion:

Lecture halls and data show and MERC labs

Course coordinator: Dr. Mohamed Salama

Programme Director: Prof.Mohamed Sobh

Date: