PROGRAMME SPECIFICATION

Regenerative Medicine Programme (RMD)

Faculty of Medicine- Mansoura University

(A) Administrative information

(1) Programme Title & Code	Regenerative Medicine Programme/RMD
(2) Final award/degree	PhD
(3) Department (s)	Medical Experimental Research Center (MERC) Faculty of Medicine (Interdisciplinary Programme)
(4) Coordinator	- Vice president of the University for Postgraduate Study & Research - Dean of Faculty of Medicine - Dean of Faculty of Pharmacy - Dean of Faculty of Science - Dean of Faculty of Veterinary Medicine - Dean of Faculty Dentistry - Director of Mansoura University Program of Regenerative Medicine - Director of Medical Experimental Research Center
(5) External evaluator (s)	----
(6) Date of last approval of programme specification by Faculty council	9/8/2016

(B) Professional information

(1) Programme Aims:

The broad aims of the Program are to:

(1) Provide candidates with interdisciplinary education in the field of stem cells, regeneration biology, tissue engineering, and clinically focused human biology and pathology with the aim to prepare students to perform research that can be applied to regenerative medicine therapies.

(2) Educate the students the scientific fundamentals of stem cell biology and regeneration model organisms as well as recent methods of genomic analysis of stem cells and model organisms, tissue engineering, current and potential applications in clinical diseases and regulatory aspects of developing regenerative therapies.

(3) Educate the students the essential methodological skills for presenting their work in oral and written form. This includes writing a term paper or a scientific article, writing a grant proposal and the organization and implementation of a clinical study.

(4) Allow students to have the experience in life sciences work and approaches. The students will be able to inter-relate elementary knowledge of molecular cell biology and developmental biology with specific theoretical and practical applications with in vitro and in vivo stem cell work which is relevant to regeneration and to human application.

(5) Allow the students to apply concepts and techniques in stem cell biology and animal models onto new research projects in regenerative biology and medicine.

(6) Enabling the students to work independently on academic or industry projects in a problem-oriented and responsible way. The students will have access to a wide range of research and development work fields, particularly in the areas of cell biology, developmental biology, stem cell biology and medicine.

(2) Intended Learning Outcomes (ILOs):

A- Knowledge and Understanding:

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

A1: Explain the chemistry that underlies molecular reactions in cells and the techniques used to investigate them.

A2: Describe the cell structure, gene structure, replication, expression, inheritance, evolution and relevant experimental methods of analysis;

A3: Illustrate the principles and recent advances in molecular genetics and its applications.

A4: Point out the principles that determine the structure of proteins, its relation to function, activity of enzymes and using relevant experimental methods of analysis.

A5: Demonstrate the molecular aspects of cell biology, immunity, differentiation and development, and how they can be investigated experimentally.

A6: Explain molecular pathology of human disease, molecular diagnostics and treatment;

A7: Mention principles of stem cells research and technology.

B- Intellectual skills:

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

B1: Analyze and solve problems related to molecular biology and genetics.

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

B3: Execute and report a research project in order to develop skills necessary for independent research.

B4: Apply theoretical concepts to the study of the molecular biology and genetics and evaluate the relationships between theory and practice.

B5: Display an awareness of the existence and nature of value judgments.

B6: Demonstrate, at a level appropriate to the award, a critical approach in enquiry and a readiness to test hypotheses, interpret scientific data and evaluate published literature.

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

B8: Identify different types of stem cells and their different capacities.

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.

C2: Practice appropriate computer skills.

C3: Isolate, characterize, culture and transdifferentiate stem cells.

C4: Conduct research of regenerative medicine in vivo.

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.

D3: Organize and present intellectual argument commensurate with the level of award.

D4: Work effectively both alone (e.g. on assignments or during the project) and as part of a team (e.g. in group work, during group discussions and workshops).

D5: Demonstrate key skills in the retrieval, preparation, analysis and interpretation of information from different sources.

D6: Acquire continued self-managed professional development.

D7: Apply the principle of reflective practice.

(3) Academic standards:

Academic standards for the programme are attached in Appendix I. in which **NARS** issued by the National Authority for Quality Assurance & Accreditation in Education are used being approved by the Faculty council on 14/7/2010. External reference points/Benchmarks are attached in Appendix II. A table of comparison between ARS, NARs and program ILOs attached in in Appendix III.

3.a- External reference points/benchmarks are selected to confirm the appropriateness of the objectives, ILOs and structure of assessment of the programme (approved by the Departments' council on and by the Faculty council on):

Regenerative Biology and Medicine of Biotec (Biotechnology Center of TU Dresden- Germany)
http://www.biotec.tu-dresden.de/fileadmin/teaching/Curriculum_RegBioMed/101217_Curriculum_RegBioMed.pdf

3.b- Comparison of the specification to the selected external reference/ benchmark:

All programme aims of the Benchmarks are covered by the current programme.
Our programme is covering 90% of the benchmark chosen.

(4) Curriculum structure and contents:

- **4.a- Duration of the programme:** 6 semesters (15 weeks each) (60 credit hours, **30 theoretical credit hours + 13 practical credit hours included in log book + other 2 credit hours scientific activities included in log book)**

- **First part : (1st semester, 5 theoretical credit hours + 1 practical credit hour included in log book)**
  - Stem cells, development and regeneration (*RMD630BS1*) (5 theoretical credit hours + 1 practical credit hour in log book)

- **Second part : (3rd, 4th , 5th and 6th semesters) (25 theoretical credit hours + 12 practical credit hours included in log book + other 2 credit hours scientific activities included in log book)**

3rd semester: (6 theoretical credit hours + 3 practical credit hour included in log book + other 0.5 credit hour scientific activities included in log book)

- Microscopy *(RMD602BS2)* (4 theoretical credit hours + 1.5 practical credit hour in log book)

- One of the two elective courses (2 theoretical credit hours + 1.5 practical credit hour in log book + other 0.5 credit hour scientific activities included in log book)

-Clinical translation and Trials in Practice *(RMD630PS1)* **or** -Model Organism Research *(RMD605RS1).*

4th semester: (7 theoretical credit hours + 3 practical credit hour included in log book + other 0.5 credit hour scientific activities included in log book)

-Molecular biology research (*RMD604BS3*) (4 theoretical credit hours + 1.5 practical credit hour in log book).

- One of the two elective courses (3 theoretical credit hours + 1.5 practical credit hour in log book + other 0.5 credit hour scientific activities included in log book)

-Pharmaceutical Control of Stem Cells (*RMD606PS2*) **or** -Cell and Organ Based Research (*RMD630RS2*)

5th semester: (6 theoretical credit hours + 3 practical credit hour included in log book)

- Scientific Working Methods and Scientific Conduct (*RMD618BS4*) (3 theoretical credit hours + 1.5 practical credit hours in log book).

- One of the two elective courses (3 theoretical credit hours + 1.5 practical credit hours in log book)

- Trends in Neuroscience (*RMD612PS3*) **or** - Bioinformatics (*RMD604RS3*)

6th semester: (6 theoretical credit hours + 3 practical credit hour included in log book + another 1 credit hour scientific activities included in log book)

- Genetic and quantitative analysis of stem cell Biology (*RMD630BS5*) (4 theoretical credit hours + 1.5 practical credit hour in log book + other 0.5 credit hour scientific activities included in log book)

- One of the two elective courses (2 theoretical credit hours + 1.5 practical credit hour in log book + other 0.5 credit hour scientific activities included in log book)

- Organ systems and disease (*RMD630PS4*) **or** -Material sciences and Tissue Engineering: (Nanotechnology and stem cells) (*RMD630RS4*)

- **Thesis (15 credit hours)**: starts at the 2nd semester for registration and lasts for the 3rd, 4th , 5th and 6th semesters .
- **Log book (15 credit hours):** distributed in semesters as practical part of the courses and other scientific activities as previously described and as demonstrated in program courses

4.b- programme structure:

Candidates should fulfill a total of 60 credit hours.

●4.b.1: Number of credit hours:

First part: 5 credit hours

Second part: 25 theoretical credit hours (4 semesters each semester include one core course + one course of two elective courses) + 15 credit hours of log book(practical: 13 credit hours & other activities: 2 credit hours seminars and workshops)

Log book 15 credit hours: (practical part of the courses: 13 credit hours & other activities: 2 credit hours seminars and workshops related to course).

Thesis: 15 credit hours.

PhD obtained through finishing: 5 taught Core courses; 4 elective courses included in two optional modules:

RMD- PS: Professional Skills modules (4 elective courses).

RMD- RS: Research Skills modules (4 elective courses).

At the end of the programme the student should pass 4 elective courses 2 from Professional Skills modules plus2 from Research Skills modules).

N.B. Core courses (5 courses):

-Stem cells, development and regeneration (BS1) -Microscopy (BS2) -Molecular Biology Research (BS3)
-Scientific Working Methods and Scientific Conduct (BS4) - Genetic and Quantitative Analysis of Stem Cell Biology (BS5).

Elective courses (8 courses):

4 Professional Skills modules **(RMD- PS)**

-Clinical Translation and Trials in Practice (PS1) - Pharmaceutical control of stem cells (PS2)
-Trends in Neuroscience (PS3) -Organ Systems and Disease (PS4)

4 Research Skills modules **(RMD- PS)**

-Model organism research (RS1) -Cell and organ based research(RS2)
-Bioinformatics (RS3) -Materials Science and Tissue Engineering: (Nanotechnology and stem cells) (RS4)

(5) Programme courses:

I- First part (Semester I)

a- Compulsory courses:

Course Title	Course Code	NO. of credit hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Stem cells, development and regeneration	*RMD630BS1*	**5**		1		**1**	**6**	**A 6,7 – B 2,3 5 7 , 8- C 3,4- D4,5,6,7.**

b- Elective courses: none

II- Second part

(Semester III)

a- Compulsory courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Microscopy	*RMD602BS2*	4		1.5		1.5	5.5	B3-C 1,2,3 D2,5,6,7

b- Elective courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Clinical Translation and Trials in Practice	*RMD630PS1*	2		1.5	0.5	2	4	A7, B1-4 C3, D1-7
Model Organism research	*RMD605RS1*	2		1.5	0.5	2	4	A 5.6, B2-6 C1,2, D1-7
Total Credits for semester III		6		3	0.5	3.5	9.5	

(Semester IV)

a- Compulsory courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Molecular Biology Research	*RMD604BS3*	4		1.5		1.5	5.5	A1-6, B1,4 –C1,2 D1,2,4,5,6,7,

b- Elective courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Pharmaceutical control of stem cells	*RMD606PS2*	3		1.5	0.5	2	5	A6.7, B2,5,7 C1,4. D1-7.
Cell and organ based research	*RMD630RS2*	3		1.5	0.5	2	5	A1-5, B1,4, C1,2 D1-7.
Total Credits for semester IV		7		3	0.5	3.5	10.5	

(Semester V)

a- Compulsory courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Scientific Working Methods and Scientific Conduct	*RMD618BS4*	3		1.5		1.5	4.5	B1-6 C1,2 D1-7,

b- Elective courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Trends in Neuroscience	*RMD612PS3*	3		1.5		1.5	4.5	B 2, 7, C1,4 D1,2.
Bioinformatics	*RMD604RS3*	3		1.5		1.5	4.5	A1-4, B1, C1, 2 D1, 2
Total Credits for semester V		6		3		3	9	

(Semester VI)

a- Compulsory courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Genetic and Quantitative Analysis of Stem Cell Biology	*RMD630BS5*	4		1.5	0.5	2	6	A1-3, 7, B1,8, C1,3 D1-7

b- Elective courses:

Course Title	Course Code	NO. of hours per week					Total credit hours	Programme ILOs covered (REFERRING TO MATRIX)
		Theoretical		Laboratory /practical	Field	Total		
		Lectures	seminars					
Organ Systems and Diseases	*RMD630PS4*	2		1.5	0.5	2	4	A6, B2,3,5,6 C1,4, D1,2
Materials Science and Tissue Engineering: (Nanotechnology and stem cells)	*RMD630RS4*	2		1.5	0.5	2	4	B 2, 7, C1, D1,2.
Total Credits for semester VI		6		3	1	4	10	

III- **Thesis (15 credit hours)**: starts at the 2nd semester for registration and lasts for the 3rd, 4th , 5th and 6th semesters .

Programme-Courses ILOs Matrix

Programme ILOs are enlisted in the first row of the table (by their code number: a1, a2……etc), then the course titles or codes are enlisted in first column, and an "x" mark is inserted where the respective course contributes to the achievement of the programme ILOs in question.

P.S. All courses` specifications are attached in Appendix IV**.**

Course Title/Code	Knowledge and Understanding							Intellectual skills								Professional/practical skills				Communication & Transferable skills						
	a1	a2	a3	a4	a5	a6	a7	b1	b2	b3	b4	b5	b6	b7	b8	c1	c2	c3	c4	d1	d2	d3	d4	d5	d6	d7
Stem cells, development and regeneration/ RMD630BS1						x	x		x	x		x		x	x			x	x				x	x	x	x
Microscopy/ RMD602BS2										x						x	x	x			x			x	x	x
Clinical Translation and trials in practice/ RMD630PS1							x	x	x	x	x							x		x	x	x	x	x	x	x
Model Organism research/ RMD605RS1					x	x			x	x	x	x	x			x	x			x	x	x	x	x	x	x
Molecular Biology Research/ RMD604BS3	x	x	x	x	x	x		x			x					x	x			x	x		x	x	x	x
Pharmaceutical control of stem cells/ RMD606PS2						x	x		x			x		x		x			x	x	x	x	x	x	x	x
Cell and organ based research/ RMD630RS2	x	x	x	x	x			x			x					x	x			x	x	x	x	x	x	x
Scientific working Methods and scientific conduct/RMD618BS4								x	x	x	x	x	x			x	x			x	x	x	x	x	x	x
Trends in Neuroscience/ RMD612PS3									x					x		x			x	x	x					
Bioinformatics/ RMD604RS3	x	x	x	x				x								x	x			x	x					
Genetic and Quantitative analysis of stem cells/RMD630BS5	x	x	x				x	x							x	x		x		x	x	x	x	x	x	x
Organ Systems and Diseases/ RMD630PS4						x			x	x		x	x			x			x	x	x					
Materials Science and Tissue Engineering: (Nanotechnology and stem cells)/ RMD630RS4									x					x		x				x	x					

(6) Programme admission requirements:

By laws regulating post graduate Studies.

●General requirements:

According to the faculty postgraduate bylaws Appendix V.

A master degree is required in medical field from faculties of medical sector. The Egyptian candidates should be affiliated to an Egyptian university or research institute, while international students should be affiliated to an equivalent international institute.

(7) Regulations for progression and programme completion:

- Registration for the MURMP

  In order to finish the degree, Student must complete minimum of 45 credit hours from total 60 hours of the program (30 include the courses of first and second parts, and 15 practical activities and other scientific activities of the log book) plus 15 credit hours for thesis.
- Courses description is included in Appendix IV.

Log book fulfillment:

- Student must fulfill a minimum of 15 credits of log book activities (13 practical part of the courses and 2 other scientific activities).
- Practical works related to the program must be documented in the log book and signed by the supervisors of the activity.
- Any workshops, conferences and scientific meetings should be included in the log book.

Attendance Criteria:

1-Courses:

First part: Minimally accepted attendance is 75%.

Second part: Minimally accepted attendance in each course is 75%.

2-Log book: for attending, the log should be fulfilled and signed by supervisors

- Conferences: at least 3 conferences
- Seminars: at least 75% of biochemistry department seminars
- Workshops: at least 2 workshops related to the research field

3-Practical work:

-lab rotation according to the schedule determined by the supervisors

4- Seminars:

-At least 2 seminars in topics determined by the supervisors must be prepared and presented by each candidate.

5- Ph. D Thesis

-At least 75% of thesis discussed in Medical Experimental Research Center (MERC).

Assessment method:

According to the Faculty bylaws

1st part exam:

Exam Description

Final exam at 6th month from admission to Ph.D degree with total of 300 marks composed of 2 Written exams for 3 hours (Short Essay questions 2 hours 240 marks + MCQ 1 hour 60 marks). **Other assessment without marks:** Logbook activities

Marks

Course/ code	Marks		
	Short Essay questions	MCQ	Total
Stem cells, development and regeneration/ RMD630BS1	**240**	**60**	**300**

2nd part exams:

Exam Description

For elective course: the final exam of each one of them 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

For compulsory courses: the final exam is composed of:

Two written exams (200 marks) **3 hours (Short Essay questions 2 hours 160 marks + MCQ 1 hour 40 marks)**

Final Practical exam (OSPE) (100 marks): five stations exam.

Final oral exam (OSCE) (100 marks): five stations exam.

Percentage of each Assessment to the total mark for compulsory courses of second part:

Written exam: 50% **Practical exam: 25%** **Oral exam: 25%**

Other assessment without marks: practical tests and exam, seminars and log book assessment are requirement of the 2nd part exam in each semester.

Marks

Course/ code	Marks					
	Written Exam			Practical Exam	Oral Exam	Total
	Short Essay questions	MCQ	total			
Microscopy/ RMD602BS2	**160**	**40**	**200**	**100**	**100**	**400**
Clinical Translation and trials in practice/ RMD630PS1	**80**	**20**	**100**	--	--	**100**
Model Organism research/ RMD605RS1	**80**	**20**	**100**	--	--	**100**
Molecular Biology Research/ RMD604BS3	**160**	**40**	**200**	**100**	**100**	**400**
Pharmaceutical control of stem cells/ RMD606PS2	**80**	**20**	**100**	--	--	**100**
Cell and organ based research/ RMD630RS2	**80**	**20**	**100**	--	--	**100**
Scientific working/ RMD618BS4	**160**	**40**	**200**	**100**	**100**	**400**
Trends in Neuroscience/ RMD612PS3	**80**	**20**	**100**	--	--	**100**
Bioinformatics/ RMD604RS3	**80**	**20**	**100**	--	--	**100**
Genetic and Quantitative analysis of stem cells/RMD630BS5	**160**	**40**	**200**	**100**	**100**	**400**
Organ Systems and Diseases/ RMD630PS4	**80**	**20**	**100**	--	--	**100**
Materials Science and Tissue Engineering: (Nanotechnology and stem cells)/ RMD630RS4	**80**	**20**	**100**	--	--	**100**

(8) Evaluation of Program's intended learning outcomes (ILOs):

Evaluator	Tools*	Signature
Internal evaluator **(s)** **Prof.** **Prof.** **Prof.**	Observation Questionnaire Workshops Group discussion	
External Evaluator **(s)** **Prof.**	Questionnaire Communication Email	
Senior student **(s)**	**None**	
Alumni	**None**	
Stakeholder **(s)**	**None**	
Others	**None**	

We certify that all information required to deliver this program is contained in the above specification and will be implemented. All course specification for this program are in place.	
Program Director: Name: **Prof. Mohamed Sobh**	Signature & date:
Executive director of the quality assurance unit: Name: **Prof. Seham Gad El-Hak**	Signature & date:
Dean of Faculty of Medicine: Name: **Prof. El-Said Abdel-Hady**	Signature & date: