"This prospectus is made under the provisions of the Universities Act, the Postgraduate Institute of Medicine Ordinance, and the General By-Laws No. 1 of 2016 and By-Laws No. 4 of 2016 for Postgraduate Diplomas and Postgraduate Certificates "

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO, SRI LANKA

PROSPECTUS

POSTGRADUATE DIPLOMA

IN

MEDICAL PHYSIOLOGY

2012

Speciality Board in Physiology

BOARD OF STUDY IN BASIC AND MEDICAL SCIENCES

Postgraduate Diploma in Medical Physiology

CONTENTS PAGE

1. Name of the degree programme

Postgraduate Diploma in Medical Physiology

2. Full title

Postgraduate Diploma in Medical Physiology

3. Abbreviated title

PgDipMedPhys

4. Background to the programme

Physiology is the study of the functions of the human body. It is one of the primary basic medical sciences. Physiological basis of disease processes is fundamental to the understanding of the nature of pathogenesis. It is said that the "Physiology of today is the medicine of tomorrow." Therefore, fundamental understanding of physiology of the human body is essential for proper understanding of disease processes. This is an essential component of many postgraduate medical courses.

The course is offered by the PGIM with contributions from teachers of the Faculties of Medicine and Dental Sciences of the major Universities in Sri Lanka who are already involved in teaching physiology at undergraduate and postgraduate levels. Practical components of the programme will be conducted at the Departments of Physiology in the Faculties of Medicine, which have the capacity to offer facilities for such a programme. Therefore adequate resource persons, laboratory capacities and library resources will be available for the students who undertake this programme.

5. Justification

Physiology is included as part of the initial component of many postgraduate medical courses. However, there is no properly structured, comprehensive physiology course offered at postgraduate level in Sri Lanka. Therefore, there is a need for a properly designed physiology course to enhance the existing knowledge and skills in physiology to be offered at postgraduate level.

In addition, newly recruited university teachers require a comprehensive understanding of physiology in order to improve the quality of undergraduate teaching. However there are no such courses available in the universities at present.

The proposed Postgraduate Diploma in Medical Physiology aims to fulfill these needs by providing basic and applied physiology knowledge and skills necessary for a health professional. This course will also bridge the gap between undergraduate knowledge in physiology and theknowledge required at postgraduate level.

6. Objectives

1. To improve knowledge and skills in physiology
2. To update the physiology knowledge with recent advancements in the field
3. To enable application of physiological principles in medical practice

7. Eligibility criteria

Prospective applicants must satisfy the following requirements:

(a) A medical degree* registered with the Sri Lanka Medical Council.
(b) Satisfactory completion of internship acceptable to the Sri Lanka Medical Council.
(c) Satisfactory completion of one year of post internship in medical/ clinical practice or teaching in a university /public /private sector institution in Sri Lanka acceptable to the PGIM
(d) The criteria prescribed in paragraphs (a) to (c) must have been satisfied by the applicants at the date of closure of applications. Where a shortfall has occurred due to any reason including sick, maternity or other leave, the candidate concerned should complete such shortfall in order to become eligible to apply.
(e) A dental /veterinary degree with three years experience following graduation provided that these graduates are involved in teaching medical or dental students.
(f) Graduate non-medical lecturers in a Faculty of Medicine, Dentistry, Veterinary Science or Allied Health Sciences with at least three years of experience in teaching.

* Foreign nationals who seek to apply to register should possess a degree registrable with the Sri Lanka Medical Council.

8. Admission process

Trainees for this course will be selected from a selection examination.

8.1 Format of the selection examination

- Duration of the selection examination is 90 minutes.
- Selection examination will consist of 30 multiple choice questions.
- Marks for this paper will be given out of 100.

8.2 Requirement to pass the selection examination

A candidate should obtain 50% or more marks to be eligible to follow this course.

8.3 Number to be selected

Maximum number enrolled will be 30 or the number indicated in the circular calling for applications. If more than the above number passes the selection examination, the selection for the programme will be based on merit.

8.4 Number of attempts

Number of attempts for the selection examination for the Postgraduate Diploma in Medical Physiology is unlimited.

9. Programme duration and credits

Total duration of the course will be 18 months.
This is a 30-credit part time weekend course (Saturday and Sunday).
This includes 28 credits of course work and 2 credits of assignments.

10. **Tuition Fee**

Local candidates: Rs. 100,000.00
(Private sector candidates will have to adhere to the PGIM regulations relevant to course and examination fees)
The course fee may be revised by the PGIM and is therefore subject to change.

11. **Course syllabus**

11.1Type of degree:
Postgraduate Diploma

11.2 Structure and design of curriculum and course synopses

This is a part time weekend course offered over a period of 1 ½ years covering all the areas in medical physiology. This course has a system-based modular structure including compulsory and optional modules. There will be 11 compulsory modules and 3 optional modules. Modules are arranged in 3 sections. Each section should be completed in a given semester. Each student should follow all compulsory modules and one of the optional modules. The teaching-learning methods of the course will include lectures, practical classes, tutorials, small group discussions(SGDs), seminars, assignments, computer-assisted learning sessions (CAL sessions) and on-line self-learning sessions. The evaluation will be based on a GPA system.

Detailed breakdown of the modules is given in the following table.
Credits are calculated on the basis of the following formula:
1 credit = 15 hours of lectures/SGDs/tutorials or 30 hours of practical/clinical demonstrations or 45 hours of assignments/seminars/CAL sessions.

	Module Name	No of Credits	Lectures/ tutes (hours)	Practicals Clinical Demonstrtions (hours)	Assignments /Seminars / CAL (hours)
Section 1	Foundation	2	28	4	-
	Haematology	3	35	14	9
	Cardiovascular physiology	3	31	24	6
	Respiratory physiology	3	39	4	12
Section 2	Renal physiology	3	40	4	9
	Gastrointestinal physiology	3	42	4	3
	Endocrine physiology	2	25	4	9
	Reproductive physiology	2	27	4	3
Section 3	Neurophysiology I	3	35	16	6
	Neurophysiology II	3	40	8	3
	Statistics	1	13		6
	Optional modules 1. Oral biology 2. Molecular Medicine 3. Environmental physiology	2	Avg:26 26 23 29	Avg: 6 6 12 -	Avg: 3 3 3 3
	Total	30	381	92	69

Avg: Average number of hours

11.3 Course Contents are given below:

1. Foundation module – 2 credits

1.1 The cell and its functions

1.2 Structure and functions of cell membrane, cytoskeleton, nucleus, nucleolus, centrosomes and other organelles

1.3 Movement of substances across cell membrane

1.4 Intercellular and intracellular communications

1.5 DNA transcription and translation/ regulation of gene expression

1.6 Cell cycle

1.7 Mitosis and meiosis

1.8 Apoptosis

1.9 Introduction to the techniques and applications of molecular biology

2 Haematology module – 3 credits

2.1 The constituents of blood and their functions
2.2 Haemopoiesis
2.3 Red cell structure and function
2.4 Structure, function and metabolism of haemoglobin
2.5 Red cell breakdown and jaundice
2.6 Anaemia and polycythaemia
2.7 White cells and their functions
2.8 Platelets and their functions
2.9 Haemostasis and fibrinolysis
2.10 Bleeding disorders
2.11 Plasma proteins - functions and diagnostic value
2.12 Blood groups
2.13 Blood transfusion
2.14 The cells, tissues and organs of the immune system
2.15 Innate and acquired immunity
2.16 Immune surveillance of tumour antigens

3 Cardiovascular physiology module – 3 credits

3.1 Physiology of cardiac muscle
3.2 Conducting system of the heart and ECG
3.3 Cardiac cycle
3.4 Haemodynamics, cardiac output and blood pressure
3.5 Regulation of cardiovascular functions
3.6 Cardiovascular changes during exercise
3.7 Microcirculation, Starling forces and oedema
3.8 Circulation in special regions
3.9 Investigations of cardiac function
3.10 Pathophysiology and principles of management of disorders in the cardiovascular system

4 Respiratory physiology module – 3 credits

4.1 Mechanics of breathing
4.2 Process of ventilation
4.3 Pulmonary blood flow
4.4 Ventilation – perfusion relationships
4.5 Gas exchange in lungs and tissues
4.6 Gas transport in blood

4.7 Control of respiratory functions
4.8 Tests of pulmonary function
4.9 Respiratory adaptations in health and disease
4.10 Hypoxia, hypercapnia and cyanosis
4.11 Pathophysiology and principles of management of respiratory disorders

5 Renal physiology module – 3 credits

5.1 Renal blood flow
5.2 Glomerular filtration
5.3 Renal clearance
5.4 Tubular functions
5.5 Countercurrent mechanisms
5.6 Urinary concentration and diuresis
5.7 Endocrine functions of kidney
5.8 Role of kidney in maintaining water, electrolyte and acid-base balance
5.9 Micturition and its abnormalities
5.10 Pathophysiology and principles of management of common renal diseases

6 Gastrointestinal physiology module – 3 credits

6.1 Neural and hormonal control of gastrointestinal functions
6.2 Saliva
6.3 Mechanism of swallowing
6.4 Motility of oesophagus
6.5 Electrical activity, motility and secretary functions of stomach
6.6 Functions of small intestine
6.7 Functions of large intestine and mechanism of defecation
6.8 Functions of liver, biliary tract and pancreas
6.9 Colonic bacterial flora, prebiotics and probiotics
6.10 Digestion and absorption of nutrients
6.11 Mechanism and consequences of vomiting
6.12 Pathophysiology and principles of management of disorders of gastro intestinal tract

7 Endocrine physiology module – 2 credits

7.1 Classification of hormones
7.2 Mechanisms of hormonal action at cellular level
7.3 Synthesis, transport, mechanism of actions, functions and regulation

of secretion of hypothalamic, pituitary, thyroid, parathyroid, pancreatic, adrenal and other hormones

7.4 Pathophysiology and principles of management of endocrine disorders

8 Reproductive physiology module – 2 credits

8.1 Overview of the anatomy of male and female reproductive systems
8.2 Sex determination and sexual differentiation
8.3 Reproductive hormones and their functions
8.4 Reproductive maturation (puberty)
8.5 Functions of the female reproductive system
8.6 Functions of the male reproductive system
8.7 Human sexual response
8.8 Fertilization and implantation
8.9 Physiology of pregnancy, parturition, labour, puerperium and lactation
8.10 Menopause and andropause
8.11 Reproductive health indices
8.12 Physiological basis of contraception
8.13 Pathophysiology and principles of management of common reproductive disorders
8.14 Subfertility
8.15 Fetal and neonatal physiology

9. Neurophysiology module I - 3 credits

9.1 Nerve and muscle electrophysiology
9.2 Somatosensory functions
9.3 Reflexes
9.4 Motor functions
9.5 Balance and equilibrium
9.6 Autonomic functions
9.7 Cerebrospinal fluid and blood brain barrier
9.8 Hypothalamic functions
9.9 Lesions of the nervous system

10. Neurophysiology module II - 3 credits

10.1 Vision
10.2 Hearing
10.3 Taste
10.4 Smell
10.5 Limbic system

10.6 Memory and learning
10.7 Sleep and arousal
10.8 EEG and evoked potentials
10.9 Speech
10.10 Neuroimaging

11. Statistics – 1 credit

11.1 Statistical testing
11.2 Probability
11.3 Analysis of variance
11.4 Multivariate analysis
11.5 Time series analysis
11.6 Non-parametric statistics
11.7 Meta-analysis
11.8 Power calculation

Optional Modules:

12. Oral biology module – 2 credits

12.1 Saliva
12.2 Mastication
12.3 Swallowing
12.4 Speech
12.5 Oral sensory and motor functions
12.6 Pathophysiology of diseases involving oral cavity

13. Molecular Medicine module – 2 credits

13.1 Introduction to human genetics
13.2 Cytogenetics
13.3 Molecular genetics
13.4 Molecular diagnostics

14. Environmental physiology module – 2 credits

14.1 Underwater environment
14.2 Physics in hyperbaric environment
14.3 Physiology and pathophysiology in hyperbaric environment
14.4 Diving illnesses
14.5 Hyperbaric oxygen therapy
14.6 Extremes of temperature
14.7 Altitude and aerospace physiology

12. **Programme delivery and learner support system**

Lectures, SGDs and tutorials: will be conducted at the PGIM.

Practicals: will be conducted at different faculties.

The locations for the practicals are given in the following table

Section	Module Name	Tentative location for practicals
1	Foundation	Faculty of Medicine, University of Kelaniya
	Haematology	Faculty of Medical Sciences, University of Sri Jayewardenepura
	Cardiovascular physiology	Faculty of Medicine, University of Ruhuna
	Respiratory physiology	Faculty of Medicine, University of Colombo
2	Renal physiology	Faculty of Medical Sciences, University of Sri Jayewardenepura
	Gastrointestinal physiology	Faculty of Medicine, University of Kelaniya
	Endocrinology	Faculty of Medical Sciences, University of Sri Jayewardenepura
	Reproductive physiology	Faculty of Medicine, University of Colombo
3	Neurophysiology I	Faculty of Medicine, University of Peradeniya
	Neurophysiology II	Faculty of Medicine, University of Peradeniya
	Statistics	Not applicable
	Optional modules 1. Oral biology 2. Molecular Medicine 3. Environmental physiology	 Faculty of Dental Sciences, University of Peradeniya Faculty of Medicine, University of Kelaniya, Ragama Not applicable

Assignments: will be conducted online

13. Evaluation Procedure

Students are assessed at the end of each section in a module-based examination. The following requirements should be fulfilled to sit the module examination.

Eligibility criteria to sit module examinations:

1. A minimum of 80% attendance for lectures, tutorials, small group discussions, practical classes and other teaching components of each module
    - A candidate, who fails to obtain 80% attendance for a module, should complete this requirement before sitting the examination.

2. Successful completion of assignments for each module
    - Trainees who fail to obtain a pass mark for an assignment can resubmit the assignment within 2 weeks of release of results of the relevant assignment. Those who fail to obtain a pass mark for an assignment in second attempt should follow the relevant module with the next available batch before sitting the examination.

3. Adherence to the PGIM rules and regulations in relation to examinations

The format of the module examinations

On completion of each section an examination will be held comprising written examination for each module and a common practical examination. The written examination consists of a multiple choice question (MCQ) paper and a structured essay question (SEQ) paper. Details of the written examination are given in the following table.

Section	Module	MCQ paper	SEQ paper
1	Foundation	1 hour (20 questions)	1 hour (3 questions)
	Haematology	1 hour (20 questions)	1 hour (3 questions)
	Cardiovascular physiology	1 hour (20 questions)	1 hour (3 questions)
	Respiratory physiology	1 hour (20 questions)	1 hour (3 questions)
2	Renal physiology	1 hour (20 questions)	1 hour (3 questions)
	Gastrointestinal physiology	1 hour (20 questions)	1 hour (3 questions)
	Endocrinology	1 hour (20 questions)	1 hour (3 questions)
	Reproductive physiology	1 hour (20 questions)	1 hour (3 questions)
3	Neurophysiology I	1 hour (20 questions)	1 hour (3 questions)
	Neurophysiology II	1 hour (20 questions)	1 hour (3 questions)
	Statistics		90 min (4 questions)
	Optional	1 hour (20 questions)	1 hour (3 questions)

The practical examinations will be in the form of an Objective Structured Practical Examination (OSPE) testing the practical knowledge and the skills of the module.

Practical skills will be tested using a module-based OSPE examination held at the end of each section. Items for OSPE examination will be distributed among the modules taught in each section except statistics. The number of OSPE questions from each module will vary from 2 to 8. Examination in each section will be 45-60min.

Calculation of grades

- Raw mark (in a scale of 0-100) for each module will be calculated by adding marks obtained for the MCQ, SEQ and OSPE components for that module.
- Distribution of marks among the three components for each module will be as follows:

No	Module	MCQ	SEQ	OSPE
1	Foundation	45%	45%	10%
3	Haematology	40%	40%	20%
4	Cardiovascular physiology	40%	40%	20%
5	Respiratory physiology	40%	40%	20%
6	Renal physiology	45%	45%	10%
7	Gastrointestinal physiology	45%	45%	10%
8	Endocrinology	40%	40%	20%
9	Reproductive physiology	45%	45%	10%
10	Neurophysiology I	40%	40%	20%
11	Neurophysiology II	40%	40%	20%
12	Statistics	-	100%	-
13	Optional	45%	45%	10%

- After calculating the total mark for each module, grades will be assigned based on the following cut-off points table.
- Rounded off raw mark will be used for grading.
- Results of module examinations will be released at the end of each section.

Grade	Mark range	Grade point
A+	85 – 100	4.0
A	80 – 84	4.0
A-	75 – 79	3.7
B+	70 – 74	3.3
B	65 – 69	3.0
B-	60 – 64	2.7
C+	55 – 59	2.3
C	50 – 54	2.0
C-	45 – 49	1.7
D+	35 – 44	1.3
D	25 – 34	1.0
E	0 – 24	0.0

The Grade Point Average (GPA) will be computed using the following formula.

$$GPA = \frac{\sum\{gi \times wi\}}{\sum wi}$$

gi- Number of grade points obtained for the module
wi- number of credit units allocated to the module
∑wi- Total number of credit units allocated to all modules

GPA will be rounded to the second decimal place.

Requirements to Pass the Postgraduate Diploma in Medical Physiology Examination

- Grade C or above for all module examinations

  AND

- GPA 2.0 or more

Referred candidates

- Candidates who obtain Grade C- or less for any module will be considered as "referred" in that module.

- If a candidate is referred in any module examination, that candidate should sit only the relevant module at the next available examination.
- All repeat examinations will be held at least 6 weeks after releasing the results of the last module examination.
- If a candidate fails to sit any component of a module (theory or OSPE) examination with a valid excuse approved by the BOS that candidate has to sit the entire module at the repeat examination as the first attempt.
- If a candidate fails to sit any component of a module (theory or OSPE) examination without a valid excuse approved by the BOS that candidate is considered as referred in that module and should sit the entire module at the repeat examination. Maximum grade that can be obtained in the repeat exam for these candidates is 'C'.
- Candidates who fail the repeat examination will be required to sit the next available examination.
- The maximum number of attempts that will be given to a candidate is six within a period of 8 years from the date of the first attempt.

Candidates who are not eligible to sit first available module examination

- If a candidate is not eligible to sit the first available examination (due to lack of 80% attendance or unsuccessful in completing relevant assignment), such candidate can rectify and sit the next available module examination.
- The maximum grade he/she will receive is grade C.

14 Award of Postgraduate Diploma in Medical Physiology

Candidates who have fulfilled admission requirements and registered as a postgraduate student by the payment of the prescribed fees and successfully completed all examinations and assignments will be awarded the Postgraduate Diploma in Medical Physiology.